2018

Missouri Deer Season Summary & Population Status Report

Missouri Department of Conservation

Prepared by:

Deer and Elk Program Staff

Resource Science Division

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Deer and Elk Program Staff

(573) 815-7901

Jason Isabelle: *Deer and Elk Program Supervisor* ext. 2902
Jasmine Batten: *Wildlife Disease Coordinator* ext. 2934
Kevyn Wiskirchen: *Private Lands Deer Biologist* ext. 2899
Aaron Hildreth: *Deer and Elk Biologist* ext. 2892
Alicia Burke: *Wildlife Health Specialist* ext. 2898
Molly Elderbrook: *Wildlife Health Specialist* ext. 2937

Deer and Elk Program Mission and Vision

The mission of the Missouri Department of Conservation's Deer and Elk Program is to use science-based wildlife management to maintain biologically and socially balanced deer and elk populations that provide sustainable recreation and that minimize conflicts with humans and the potential for negative impacts on ecosystem health. To put this mission into action, the Deer and Elk Program is guided by four management goals:

Goal 1: Deer and Elk Population Management – Proactively manage deer and elk populations for a balanced sex and age structure while maintaining densities at or below the biological and social carrying capacity within the defined management units using science-based wildlife management practices.

Goal 2: Hunting and Recreation – Provide opportunities for all citizens to enjoy deer- and elk-related recreational activities and promote hunting as a socially and culturally important tradition which is the primary tool for achieving deer and elk population goals.

Goal 3: Health and Disease Management – Ensure the maintenance of healthy deer and elk populations and minimize the threat and impacts of disease on deer and elk populations in Missouri.

Goal 4: Education, Communication, and Public Engagement – Provide adequate information to the public about all aspects of deer and elk management in Missouri and create opportunities for additional public engagement in decisions about the management of Missouri's deer and elk resources.

The Deer and Elk Program, managed by the Resource Science Division, develops annual regulation recommendations based on harvest data, hunter and landowner surveys, MDC staff surveys, public comments, population simulations, and the Chronic Wasting Disease (CWD) Surveillance and Management Plan. The protection and management of all of Missouri's valuable wildlife is made possible thanks to private landowners and all other Missourians supporting the one-eighth of one percent Conservation Sales Tax, permit sales, and income generated by fish and wildlife tourism.

Thank you!



Equal Opportunity to Participate

Equal opportunity to participate in, and benefit from, programs of the Missouri Department of Conservation is available to all individuals without regard to their race, color, nationality, sex, age, or disability. Questions should be directed to the Department of Conservation, PO Box 180, Jefferson City, MO 65102, 573-751-4115 (voice) or 800-735-2966 (TTY), or to the U.S. Fish and Wildlife Service Division of Federal Assistance, 4401 N. Fairfax Drive, Mail Stop: MBSP-4020, Arlington, VA 22203.

2018 Deer Season Overview

Season	Dates	What Was New for 2018?
Archery Deer and Turkey	Sept. 15-Nov. 9, 2018 Nov. 21, 2018-Jan. 15, 2019	• New counties were added to the CWD Management Zone. • The antler-point restriction was removed from Grundy and Mercer counties. • Hunters could fill one firearms antlerless permit in Madison county. • Hunters could fill two firearms antlerless permits in Grundy, McDonald, Mercer, and Perry counties. • Qualifying landowners in Bollinger, Cape Girardeau, Madison, McDonald, and Perry counties could receive two no-cost firearms antlerless permits. • Hunters could use archery antlerless permits in Butler, Iron, and Reynolds counties.
Firearms Deer Early Youth Portion	Oct. 25-28, 2018	
Firearms Deer November Portion	Nov. 10-20, 2018	
Firearms Deer Late Youth Portion	Nov. 23-25, 2018	
Firearms Deer Antlerless Portion	Nov. 30-Dec. 2, 2018	• Howell County was open during the antlerless portion of firearms deer season. • Andrew, Atchison, Holt and Nodaway counties were closed during the antlerless portion of firearms deer season. • Deer that were harvested in counties where CWD has been found needed to be tested before they could be donated to Share the Harvest. • Due to federal and state regulations, individuals were required to provide a Social Security Number to obtain hunting, fishing, and trapping permits.
Firearms Deer Alternative Methods Portion	Dec. 22, 2018-Jan. 1, 2019	

Season Summary

Overall, 2018 was a great year for Missouri deer hunters. Total deer harvest was 2% higher than in 2017 (**Table 1**) and was characterized by another record antlered buck harvest (**Figure 1**) as well as a record archery harvest. Whereas some portions of the deer season saw lower harvest than in 2017 (early youth down 22%, late youth down 17%, antlerless down 15%), the longer season portions saw increases (November up 4%, alternative methods up 21%, archery up 2%; **Table 2**). The 2018 deer season harvest was the 6th ranked harvest on record in Missouri. A high harvest total in 2018 was a product of a growing deer population, liberalized harvest opportunities within the CWD Management Zone, and favorable timing of the November firearms opener coinciding with the peak of breeding.

Table 1. Total 2018 harvest by region compared to 2017, the 5-year average, and the 10-year average.

2018 Harvest Overview				
Region	Total Harvest	Difference from 2017	Difference from 5-yr Avg.	Difference from 10-yr Avg.
Central	46,738	7%	10%	7%
Kansas City	28,539	0%	2%	-4%
Northeast	43,512	11%	11%	2%
Northwest	30,151	4%	5%	-10%
Ozark	39,821	-12%	-2%	2%
Southeast	33,573	3%	2%	13%
Southwest	40,755	-5%	6%	9%
St. Louis	27,135	0%	6%	8%
Statewide	**290,224**	**2%**	**2%**	**-12%**

Statewide Deer Management

Deer populations across much of Missouri are currently at desired levels (**Figure 13**), based on feedback from hunters, landowners, and agricultural producers. Therefore, statewide deer management goals are largely focused on stabilizing deer numbers. As deer populations continue to grow, the MDC Deer and Elk Program will look for opportunities to liberalize harvest to address any negative social issues that arise. Statewide deer management also continues to be focused on minimizing the impacts of Chronic Wasting Disease (CWD). Surveillance for CWD is ongoing across the state to detect new areas of infection. Where CWD is known to occur, harvest is liberalized to keep the population at moderate to low densities and to remove additional infected animals. These measures help limit additional disease spread to healthy animals or new locations.

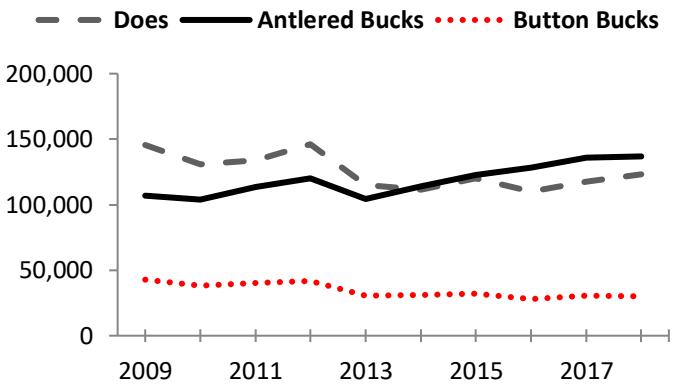
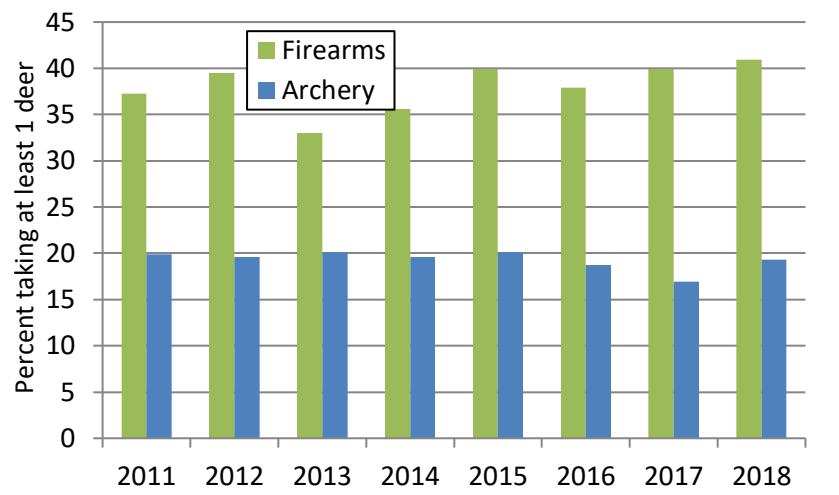
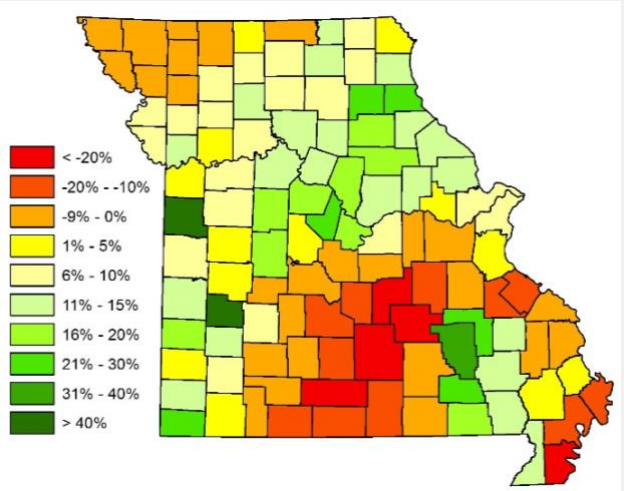


Figure 1. Number of does, antlered bucks, and button bucks harvested statewide from 2009 to 2018.

Archery and Firearms Season: By the Numbers

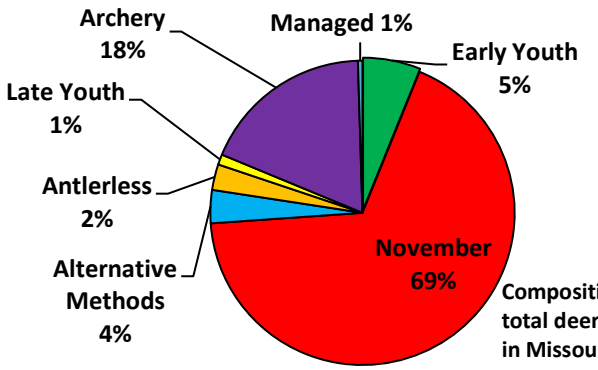


Success rates of firearms and archery deer hunters from 2011-2018. Firearms and archery hunter success rates increased in 2018. Firearms hunter success was the highest in recent history exceeding 40% of hunters taking a deer.



Percent change in total deer harvest by county in 2018 compared to the 2017 deer season.

On an annual basis, more than two-thirds of the total deer harvest takes place during the 11-day November portion of the firearms deer season, with one-third of the annual harvest falling on opening weekend alone. Archery season typically accounts for 17-20% of the annual harvest, with other firearms portions having a smaller impact on season totals.



Composition of total deer harvest in Missouri by season, 2018.

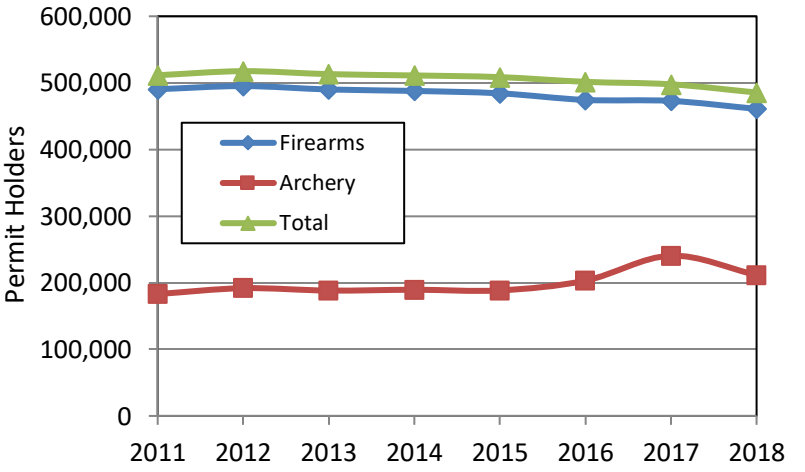


Figure 2. Trend in any-deer permit holders, 2011-2018.

There are about 460,000 firearms deer permit holders in Missouri and about 200,000 archery deer permit holders. Although deer hunting remains a very popular activity for Missouri residents and our guests, we have seen declines in the number of firearms permits over the past 5 years. This trend is not unique to Missouri, many other states have also experienced declining hunter numbers. Hunter recruitment and retention remains an important priority for MDC. The number of archery permit holders has recently displayed an increasing trend, partly due to allowing crossbows as a legal method for all archers. The large increase in 2017 was a result of a change to the permitting system with some landowners receiving archery deer permits that had no intention of using them. Thus, the 2018 number more accurately reflects trends in archery hunter participation.

Table 2. Deer Season Harvest Comparison: 2017-2018

Season Portion	Antlered Bucks			Button Bucks			Does			Total		
	2017	*2018*	*Change*	*2017*	*2018*	*Change*	*2017*	*2018*	*Change*	*2017*	*2018*	*Change*
Archery	21,283	20,708	-3%	5,347	5,351	<1%	25,361	26,864	6%	51,991	52,923	2%
Managed Hunts	395	439	11%	218	235	8%	749	895	19%	1,362	1,569	15%
Early Youth	10,124	7,834	-23%	1,617	1,447	-11%	5,671	4,364	-23%	17,412	13,645	-22%
Late Youth	1,299	1,160	-11%	453	338	-25%	1,363	1,097	-20%	3,115	2,595	-17%
November	100,161	103,582	3%	20,267	20,041	-1%	72,369	77,115	7%	192,797	200,738	4%
Alternative Methods	2,830	3,096	9%	1,311	1,588	21%	5,886	7,425	26%	10,027	12,109	21%
Antlerless	35	32	-9%	1,389	1,114	-20%	6,349	5,499	-13%	7,773	6,645	-15%
Total	**136,127**	**136,851**	**1%**	**30,602**	**30,114**	**-2%**	**117,748**	**123,259**	**5%**	**284,477**	**290,224**	**2%**

Table 3. Permits Issued and Harvest by Permit Type

Permit Type[1]	Number of Permits			Number of Deer Harvested		
	2017	2018	Change	2017	2018	Change
Permittee Archery Any-Deer	116,098	117,142	1%	24,986	24,483	-2%
Landowner Archery Any-Deer	130,786	98,653	-25%	6,251	6,117	-2%
Youth Archery Any-Deer	7,563	7,645	1%	1,157	1,180	2%
Permittee Archery Antlerless	54,275	59,214	9%	13,247	14,767	11%
Landowner Archery Antlerless	251,087	187,967	-25%	6,654	6,506	-2%
Youth Archery Antlerless	2,777	3,168	14%	438	504	15%
Permittee Firearms Any-Deer	284,575	278,289	-2%	83,300	87,470	5%
Landowner Firearms Any-Deer	180,285	172,775	-4%	40,896	39,547	-3%
Youth Firearms Any-Deer	53,215	50,512	-5%	20,570	18,264	-11%
Permittee Firearms Antlerless	185,428	187,688	1%	55,049	59,314	8%
Landowner Firearms Antlerless	159,899	158,272	-1%	22,824	22,945	1%
Youth Firearms Antlerless	24,195	24,036	-1%	7,231	7,056	-2%
Resident Firearms	854,590	837,402	-2%	216,135	219,429	2%
Nonresident Firearms	33,007	34,170	4%	13,735	15,167	10%
Resident Archery	548,347	458,439	-16%	47,980	48,632	1%
Nonresident Archery	14,236	15,350	8%	4,753	4,925	4%

[1] This table is not an inclusive list of permit types.

Table 4. Deer Hunter and Harvest Numbers

	Archery	Firearms	Archery & Firearms Combined
Age Distribution of Hunters	**Number of Hunters**		**Total Hunters[1]**
10 or younger	3,473	21,512	21,853
11-15	11,229	42,418	43,243
16-40	86,697	170,889	184,120
41 or older	110,051	226,155	236,291
Total hunters	211,450	460,974	485,507
Any-Deer Permits Issued	**Number of Permits**		**Number of Hunters[1]**
Resident	112,836	306,153	324,295
Nonresident	11,951	22,648	31,091
Landowner	98,653	172,775	174,915
Antlerless Permit Sales[2]	**Number of Hunters**		**Total Hunters**
1	38,417	155,505	143,290
2	7,172	23,219	39,477
3	1,555	2,124	8,661
4 or more	1,010	769	5,486
Deer Harvested	**Number of Hunters**		**Number of Hunters[3]**
0	170,677	272,178	276,435
1	31,798	149,173	151,711
2	6,670	33,668	42,434
3	1,508	5,235	10,466
4 or more	797	720	4,461
Antlered Bucks Harvested	**Number of Hunters**		**Number of Hunters[3]**
0	190,900	346,409	356,818
1	20,064	113,685	120,965
2	478	824 [4]	7,596
Deer Harvested	**Percent of Hunters**		**Percent of Hunters[3]**
0	81%	59%	57%
1	15%	32%	31%
2	3%	7%	9%
3 or more	1.1%	1.3%	3.1%
Antlered Bucks Harvested	**Percent of Hunters**		**Percent of Hunters[3]**
0	90%	75%	73%
1	9%	25%	25%
2	0.2%	0.16%[4]	1.6%

[1] Number of individuals that held an archery and/or firearms any-deer permit.

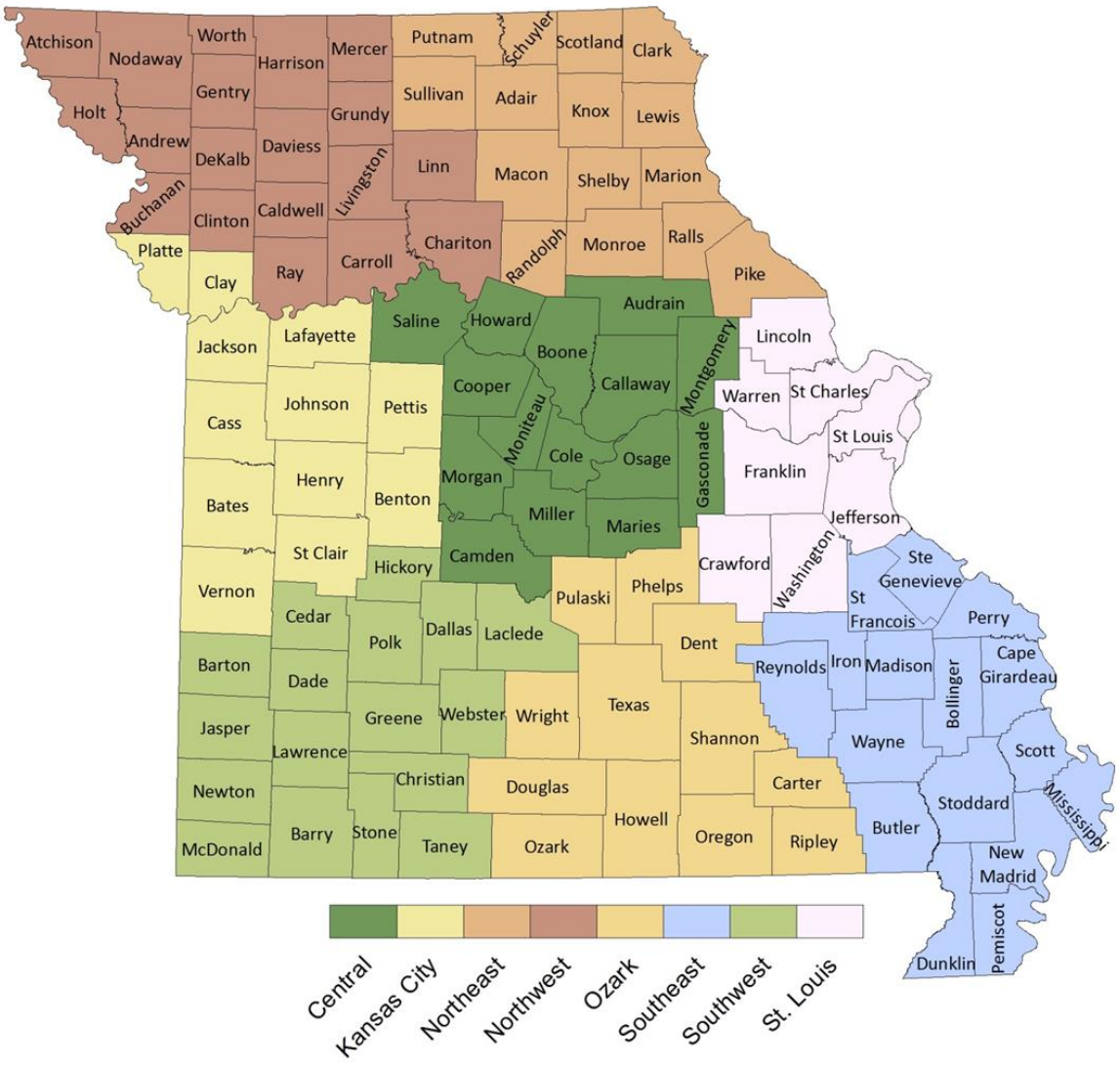
[2] Excludes no-cost landowner permits.

[3] Number/Percent of hunters that harvested the specified number when combining their archery and firearms harvest.

[4] Includes hunters that harvested antlered bucks during managed hunts.

Deer Population Status

Statewide deer population trends are important; however, regional trends are more informative to most landowners and hunters. It is also important to acknowledge that deer populations can vary considerably within a region and even within a county. Regional and local diversity in deer numbers can be a result of differences in land cover and use, harvest regulations, hunter goals and density, and disease events. Therefore, regional information should be considered as a starting point when evaluating deer populations within a localized area.



Regional Offices

Central Region
3500 East Gans Road
Columbia, MO 65201
573-815-7900

Kansas City Region
12405 SE Ranson Road
Lee's Summit, MO 64082
816-622-0900

Northwest Region
701 James McCarthy Drive
St. Joseph, MO 64507
816-271-3100

Ozark Region
551 Joe Jones Blvd.
West Plains, MO 65775
417-256-7161

Southeast Region
2302 County Park Drive
Cape Girardeau, MO 63701
573-290-5730

Northeast Region
3500 S. Baltimore
Kirksville, MO 63501
660-785-2420

Southwest Region
2630 N. Mayfair
Springfield, MO 65803
417-895-6880

St. Louis Region
2360 Highway D
St. Charles, MO 63304
636-441-4554

Central Region Deer Summary

In 2018, the Central Region had the highest regional deer harvest with a total of 46,738 deer (**Table 1, Figure 3**) which was 7% higher than in 2017. In 2018, the Central Region ranked 3rd among regions for the number of deer harvested per square mile. Top harvest counties within the region were Callaway, Osage, and Morgan. The deer population in the Central Region continues to recover from a low point in 2013 following a particularly extreme outbreak of hemorrhagic disease. Survey data indicate that regional deer numbers are at socially-acceptable numbers (**Figure 13**).

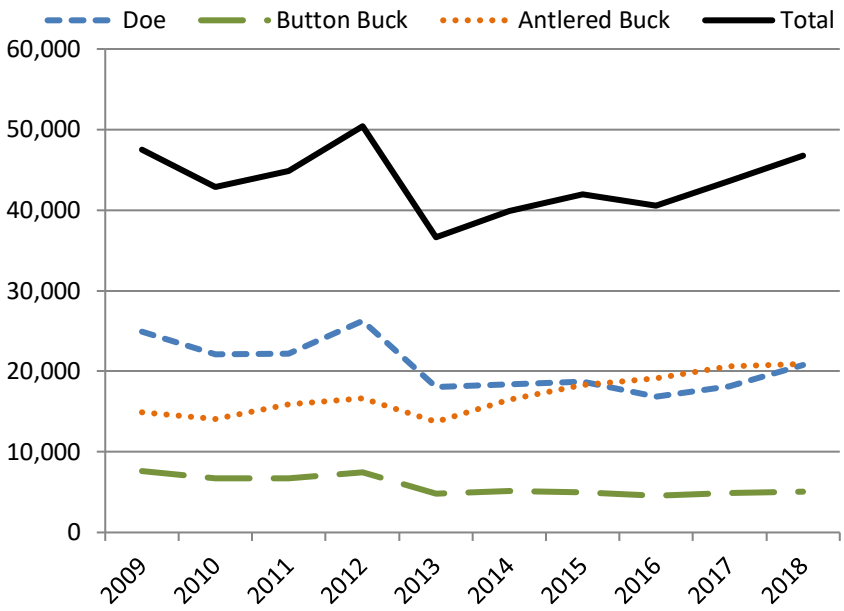


Figure 3. Central Region harvest trend from 2009-2018.

County	Total Harvest	Harvested Deer Per Square Mile	Trips per Kill (Firearms)	Public Land Hunting Acres	Number Public Hunting Areas
Audrain	2,235	3.4	5.7	1,975	5
Boone	3,644	6.0	7.4	14,142	11
Callaway	5,581	7.1	6.1	26,438	7
Camden	3,298	5.4	7.3	3,127	6
Cole	1,939	5.6	11.2	4,443	7
Cooper	2,672	5.0	5.8	5,505	2
Gasconade	3,765	7.6	9.4	1,437	1
Howard	2,504	5.8	7.3	8,062	6
Maries	2,219	4.3	7.9	2,315	3
Miller	3,056	5.4	9.8	5,310	3
Moniteau	1,851	4.6	4.7	4,427	5
Montgomery	3,241	6.4	9.4	4,162	8
Morgan	4,093	7.1	6.0	3,955	7
Osage	4,682	8.1	6.3	3,238	5
Saline	1,958	2.8	8.9	8,700	4
Total (t)/Avg (a)	**t = 46,738**	**a = 5.6**	**a = 7.5**	**t = 97,236**	**t = 80**

Kansas City Region Deer Summary

Total harvest for the Kansas City Region was 8% higher in 2018 than in 2017 at 28,539 deer harvested (**Table 1, Figure 4**). The deer harvest ranked 7th among the other regions. In 2018, the Kansas City Region also ranked 7th among regions for the number of deer harvested per square mile. Top harvest counties within the region were Benton, St. Claire, and Henry. The deer population continues to increase following the decline that occurred because of the 2012 hemorrhagic disease outbreak. Survey data indicate that regional deer numbers are at socially-acceptable numbers (**Figure 13**).

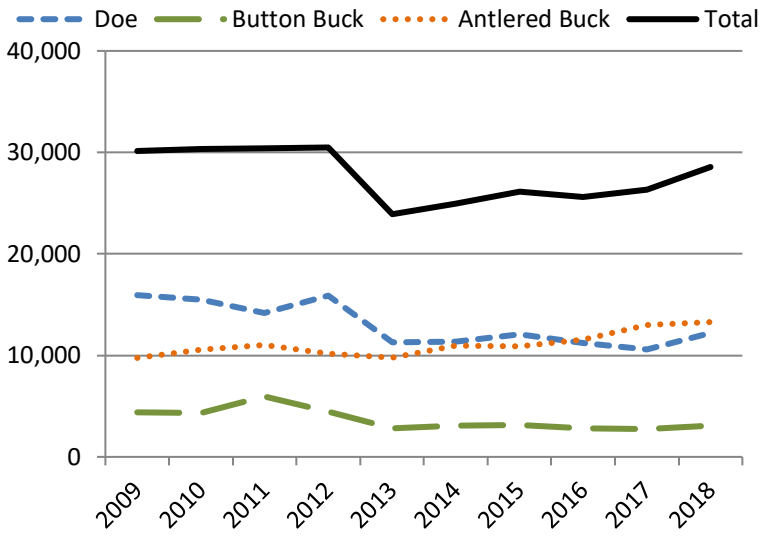


Figure 4. Kansas City Region harvest trend from 2009-2018.

County	Total Harvest	Harvested Deer Per Square Mile	Trips per Kill (Firearms)	Public Land Hunting Acres	Number Public Hunting Areas
Bates	2,028	2.6	10.8	5,728	6
Benton	4,555	6.8	6.2	13,845	11
Cass	2,314	3.7	6.7	5,137	4
Clay	967	3.2	11.3	1,411	2
Henry	3,058	5.1	8.3	31,928	7
Jackson	1,765	4.6	5.3	4,851	6
Johnson	2,677	0.3	11.4	4,579	3
Lafayette	1,339	2.3	6.9	2,272	5
Pettis	2,370	3.7	8.0	3,149	12
Platte	987	2.8	15.7	4,225	6
Saint Clair	3,594	5.7	4.9	28,057	9
Vernon	2,885	4.0	9.3	27,092	13
Total (t)/Avg (a)	**t = 28,539**	**a = 3.7**	**a = 8.7**	**t = 132,274**	**t = 84**

Northeast Region Deer Summary

Total harvest for the Northeast Region in 2018 was 43,512, which was 11% higher than in 2017 (**Table 1, Figure 5**). The deer harvest ranked 2nd among the other regions, and the Northeast Region also ranked second in the number of deer harvested per square mile. Top harvest counties in 2018 were Pike, Macon, and Monroe. Following a considerable decline in deer numbers caused by the hemorrhagic disease outbreak in 2012, deer numbers in the Northeast Region have slowly rebounded. Survey data indicate that regional deer numbers are at socially-acceptable numbers (**Figure 13**).

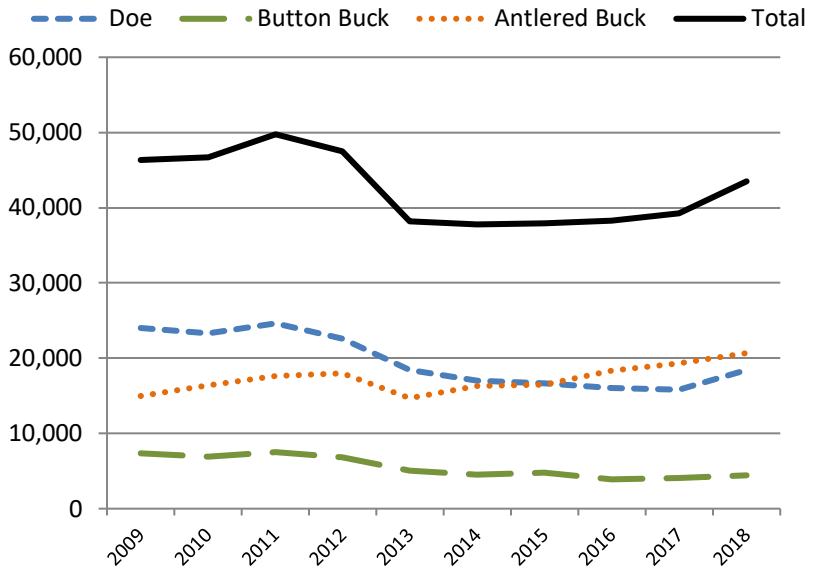


Figure 5. Northeast Region harvest trend from 2009-2018.

County	Total Harvest	Harvested Deer Per Square Mile	Trips per Kill (Firearms)	Public Land Hunting Acres	Number Public Hunting Areas
Adair	3,010	5.7	8.7	6,634	5
Clark	2,522	5.3	8.0	6,627	7
Knox	2,643	5.6	7.5	1,244	2
Lewis	2,342	5.0	7.0	8,313	6
Macon	4,310	5.7	7.7	15,551	11
Marion	2,279	5.6	12.7	3,850	11
Monroe	3,519	5.8	8.1	2,976	5
Pike	4,386	7.0	6.8	13,856	6
Putnam	2,703	5.6	6.5	5,290	4
Ralls	2,499	5.6	8.6	1,200	2
Randolph	2,727	6.1	6.8	6,493	3
Schuyler	1,846	6.4	4.7	1,159	1
Scotland	2,966	7.2	6.1	4,045	2
Shelby	2,986	6.4	8.0	2,202	6
Sullivan	2,774	4.6	7.3	9,691	5
Total (t)/Avg (a)	**t = 43,512**	**a = 5.8**	**a = 7.6**	**t = 89,131**	**t = 76**

Northwest Region Deer Summary

In 2018, total harvest for the Northwest Region was 30,151, which was 4% higher than the 2017 harvest total **(Table 1, Figure 6)**. The Northwest Region ranked 6th in total deer harvest and 8th in deer harvested per square mile. Top harvest counties were Harrison, Linn, and Daviess. Over the past 10 years, deer population estimates and harvest in the Northwest Region have declined more sharply than any other region. These declines are attributed to a severe hemorrhagic outbreak in 2012, as well as historically liberal antlerless harvest and habitat loss through conversion of CRP to row-crop agriculture. Although the deer population in most Northwest Region counties is at socially-acceptable levels, deer numbers in the extreme northwest portion of the region remain below desirable levels (**Figure 13**).

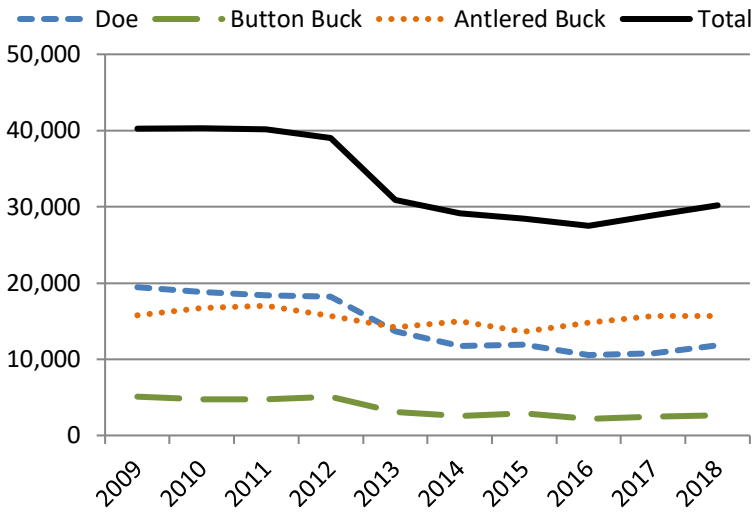


Figure 6. Northwest Region harvest trend from 2009-2018.

County	Total Harvest	Harvested Deer Per Square Mile	Trips per Kill (Firearms)	Public Land Hunting Acres	Number Public Hunting Areas
Andrew	1,026	2.5	10.2	6,236	9
Atchison	638	1.2	10.6	9,989	8
Buchanan	785	2.2	8.9	3,830	10
Caldwell	1,445	3.6	8.9	1,941	1
Carroll	2,200	3.4	9.0	3,985	4
Chariton	2,148	3.3	7.3	2,440	9
Clinton	800	2.1	16.4	992	1
Daviess	2,345	4.4	7.0	907	3
Dekalb	938	2.4	6.6	4,372	2
Gentry	1,311	2.8	6.8	2,070	4
Grundy	1,682	4.2	5.5	93	2
Harrison	2,855	4.2	9.5	5,094	5
Holt	864	2.0	13.6	16,982	12
Linn	2,852	5.1	7.9	6,744	2
Livingston	2,036	4.2	8.0	9,161	3
Mercer	2,259	5.3	5.8	3,053	5
Nodaway	1,541	1.8	6.2	5,406	2
Ray	1,478	2.8	6.9	1,786	3
Worth	948	3.7	8.7	3,399	3
Total (t)/Avg (a)	**t = 30,151**	**a = 3.2**	**a = 8.6**	**t = 88,480**	**t = 88**

Ozark Region Deer Summary

Total deer harvest in the Ozark Region in 2018 was 39,821, which was 12% higher than in 2017 (**Table 1, Figure 7**). The Ozark Region ranked 4th in total harvest and 5th in harvest per square mile. Top harvest counties in 2018 were Howell, Texas, and Oregon. The deer population in the Ozark Region has been increasing steadily (**Figure 7**) as has the deer population in much of southern Missouri. Surveys indicate that the deer populations across most of the Ozark Region are currently at socially-acceptable numbers (**Figure 13**).

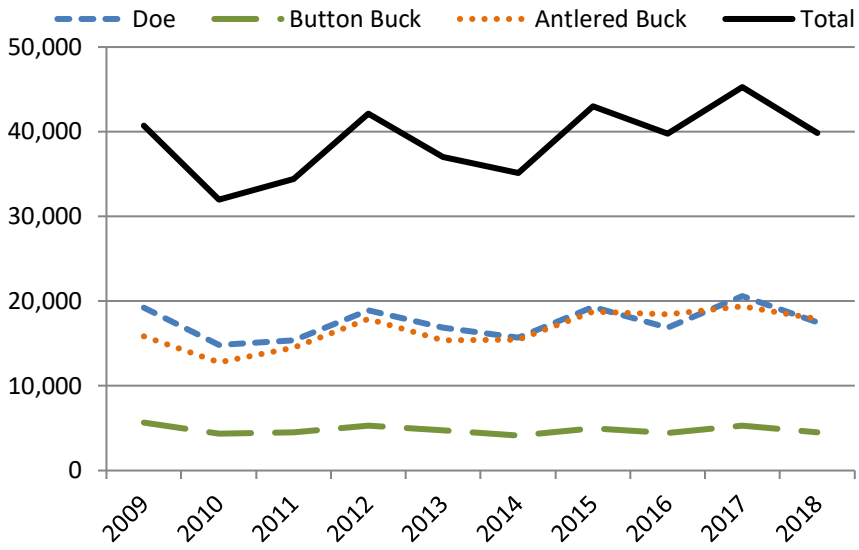


Figure 7. Ozark Region harvest trend from 2009-2018.

County	Total Harvest	Harvested Deer Per Square Mile	Trips per Kill (Firearms)	Public Land Hunting Acres	Number Public Hunting Areas
Carter	2,777	5.6	9.9	156,341	9
Dent	3,104	4.2	6.2	96,125	12
Douglas	2,653	3.3	6.2	43,388	5
Howell	5,341	6.0	6.7	59,283	9
Oregon	4,429	5.7	4.0	106,829	4
Ozark	2,670	3.7	6.0	68,022	7
Phelps	2,406	3.7	5.5	68,228	6
Pulaski	2,234	4.3	9.0	92,159	15
Ripley	4,233	7.0	6.3	111,847	8
Shannon	2,942	3.0	8.1	380,637	12
Texas	4,495	3.9	7.4	70,271	14
Wright	2,537	3.8	5.6	9,722	6
Total (t)/Avg (a)	**t = 39,821**	**a = 4.5**	**a = 6.7**	**t = 1,262,852**	**t = 107**

Southeast Region Deer Summary

The total deer harvest within the Southeast Region in 2018 was 33,573, which was 3% higher than in 2017 (**Table 1, Figure 8**). Among regions, the Southeast Region ranked 5th in total deer harvest and 6th in harvest per square mile. Top harvest counties were Wayne, Bollinger, and Reynolds. The region has some of the most diverse habitat in the state causing the deer population to vary dramatically throughout the region. Like the Ozark Region, the deer population in the Southeast Region has been growing for a number of years. Survey data indicate that the regional deer population at socially-acceptable levels with only a few counties below desired levels (**Figure 13**).

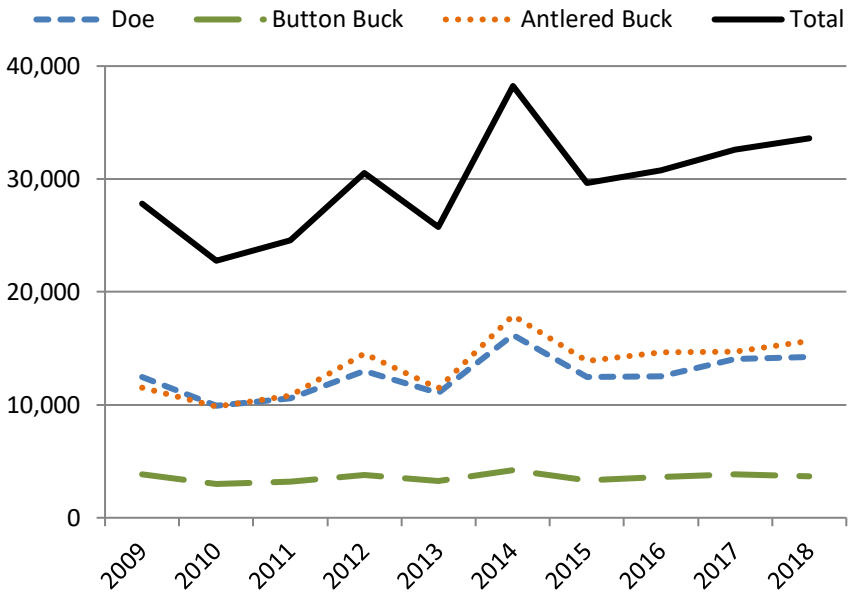


Figure 8. Southeast Region harvest trend from 2009-2018.

County	Total Harvest	Harvested Deer Per Square Mile	Trips per Kill (Firearms)	Public Land Hunting Acres	Number Public Hunting Areas
Bollinger	4,226	7.1	6.5	16,124	13
Butler	2,455	3.9	9.9	62,724	10
Cape Girardeau	2,940	5.5	9.1	4,187	6
Dunklin	486	1.0	7.4	6,754	7
Iron	1,803	3.4	10.2	107,229	7
Madison	2,547	5.3	8.9	55,966	5
Mississippi	282	0.7	6.0	5,182	2
New Madrid	335	0.5	13.5	6,380	3
Pemiscot	134	0.3	10.9	9,231	3
Perry	2,938	6.5	6.9	1,664	3
Reynolds	3,087	3.9	12.2	166,715	8
Saint Francois	2,294	5.7	5.8	1,384	3
Sainte Genevieve	2,236	4.7	8.0	12,764	3
Scott	765	1.9	9.8	1,240	3
Stoddard	2,124	2.7	9.9	17,736	7
Wayne	4,921	6.9	7.1	124,881	15
Total (t)/Avg (a)	**t = 33,573**	**a = 3.8**	**a = 8.9**	**t = 600,161**	**t = 98**

Southwest Region Deer Summary

During the 2018 hunting season, 40,755 deer were harvested in the Southwest Region. This total was 1% lower than the 2017 harvest (**Table 1, Figure 9**). Regional deer harvest ranked 3rd, and the number of deer harvested per square mile ranked 4th. Top harvest counties were Laclede, Dallas, and Polk. The deer population has exhibited a slowly increasing trend over the last 10 years. Survey data indicate the regional deer population is at socially-acceptable levels (**Figure 13**).

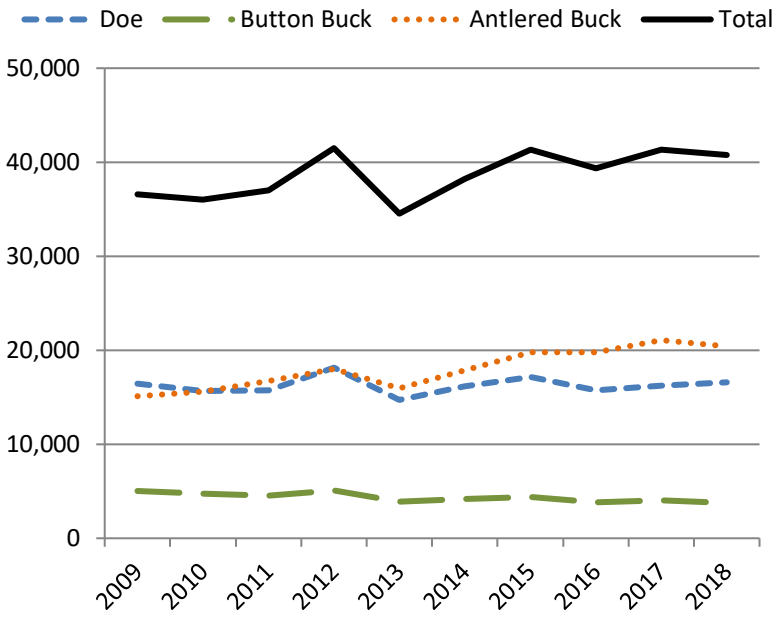


Figure 8. Southwest Region harvest trend from 2009-2018.

County	Total Harvest	Harvested Deer Per Square Mile	Trips per Kill (Firearms)	Public Land Hunting Acres	Number Public Hunting Areas
Barry	2,373	3.2	9.3	58,665	4
Barton	1,965	3.6	10.0	7,335	15
Cedar	2,440	5.4	6.4	4,656	7
Christian	2,128	4.0	6.5	54,982	2
Dade	1,675	3.5	6.9	13,951	7
Dallas	3,149	6.0	5.5	8,956	6
Greene	2,817	4.9	6.6	4,798	6
Hickory	2,414	6.2	5.0	10,444	6
Jasper	2,453	4.4	5.9	0	0
Laclede	3,350	4.6	10.3	32,553	6
Lawrence	1,966	3.3	12.3	4,906	4
McDonald	2,076	4.0	11.1	3,178	7
Newton	2,524	4.3	7.6	6,964	8
Polk	2,848	9.1	7.2	9,342	6
Stone	1,654	3.8	7.6	13,000	6
Taney	2,165	3.8	7.7	95,516	6
Webster	2,758	4.9	8.8	1,723	3
Total (t)/Avg (a)	**t = 40,755**	**a = 4.6**	**a = 7.9**	**t = 330,969**	**t = 99**

St. Louis Region Deer Summary

A total of 27,135 deer were harvested in the St. Louis Region in 2018, which was very similar (w/in 1%) to the harvest in 2017 (**Table 1, Figure 10**). The St. Louis Region ranked 8th in total deer harvest and 1st in deer harvest per square mile of forest. Top harvest counties were Franklin, Jefferson, and Lincoln. The deer population in the St. Louis Region has been increasing slowly over the last 10 years. Survey data indicate that the deer population within the St. Louis Region is largely at socially-acceptable levels (**Figure 13**).

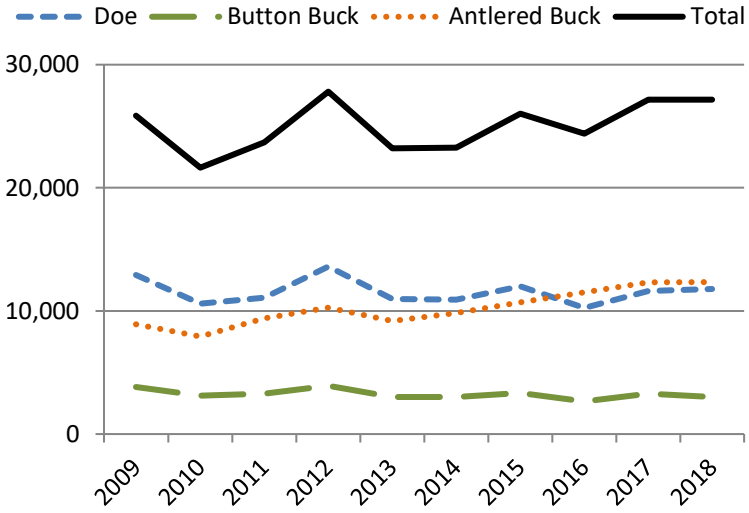


Figure 10. St. Louis Region harvest trend from 2009-2018.

County	Total Harvest	Harvested Deer Per Square Mile	Trips per Kill (Firearms)	Public Land Hunting Acres	Number Public Hunting Areas
Crawford	3,336	4.7	8.4	59,895	8
Franklin	5,814	6.9	8.4	9,259	6
Jefferson	4,565	8.0	9.6	4,128	7
Lincoln	3,659	6.4	8.5	11,287	9
Saint Charles	2,190	5.1	6.9	25,658	7
Saint Louis	1,954	8.8	6.8	14,825	11
Washington	2,800	3.8	12.3	94,074	6
Warren	2,817	7.0	9.8	7,904	3
Total (t)/Avg (a)	**t = 27,135**	**a = 6.3**	**a = 8.8**	**t = 227,030**	**t = 57**

County Deer Population Trends

Deer populations can be highly variable within a region and even within a county due to variation in habitat availability, harvest regulations, local hunter goals and density, amount of public and private land, and disease outbreaks (e.g., hemorrhagic disease). Therefore, county-wide assessments of deer population trends are not applicable to every local situation but are a general representation of the status and population trend.

The Deer and Elk Program evaluates a variety of data to assess county-specific deer populations and for hunting regulation development including:

- **Harvest data** —The total number and composition (antlered bucks, does, and button bucks) of harvested deer.
- **Population data** — Population simulations incorporating age-at-harvest data and estimated survival and reproduction rates.
- **Hunter, landowner, and staff surveys** — Hunters and landowners are randomly selected to receive mail surveys.
- **Public & staff input** — Input is received via email, the MDC website, public meetings, and phone calls.

Survey data is critical when assessing the deer population in relation to public acceptance levels. In cooperation with the USDA, we send out surveys statewide to about 9,000 agricultural producers to assess perceptions and attitudes toward deer populations and regulations. Additionally, we survey about 35,000 archery hunters and about 50,000 firearms hunters to estimate hunter effort, hunter density, and opinions concerning deer populations and regulations. We also consider public comments received throughout the year via the web, letters, calls, social media, public meetings, and emails.

The Deer and Elk Program reviews this information annually on a county-by-county basis to classify the deer population status and trends **(Figures 3-10)**. Socially acceptable levels (cultural carrying capacity) are the first thing we look at when classifying the status of the deer population. While biological carrying capacity, or the habitat's limitations on the number of deer that can be supported, is included within our assessment, cultural carrying capacity will typically be met first. We aim for this goal because agricultural producers, motorists, and other stakeholders will not often tolerate deer population levels at biological carrying capacity. By monitoring population trends for each county, we can gain an understanding of population status and adjust harvest regulations accordingly.

The goal of MDC's Deer Management Program is to maintain stable deer populations within each county that are at a socially acceptable level for the majority of interested stakeholders. Currently, deer populations are stable to increasing across most of Missouri and are generally at socially acceptable levels. Exceptions include portions of northwestern Missouri that are still recovering from a severe outbreak of hemorrhagic disease that occurred in 2012 as well as habitat loss due to conversion of grassland to row-crop agriculture. Across most of the state, the deer population has recovered from the population decline that occurred because of the hemorrhagic disease outbreak.

County Deer Statistics

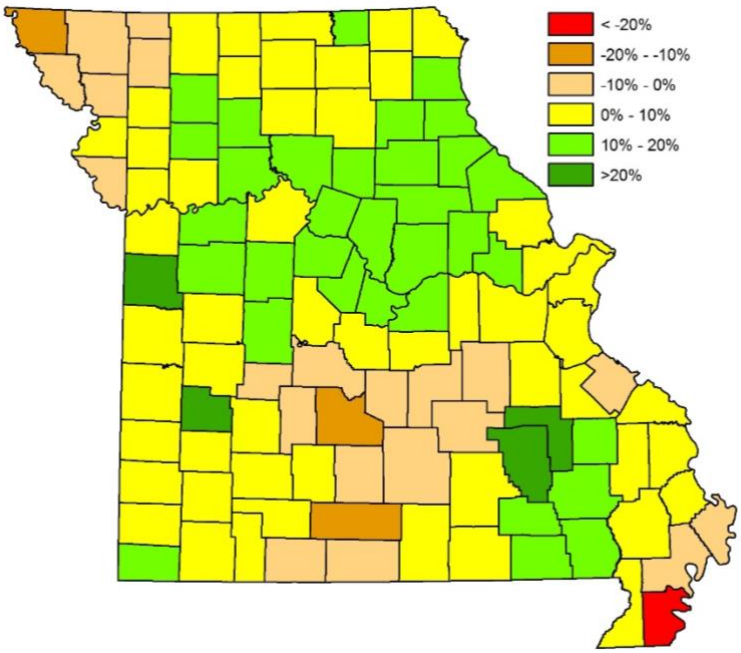


Figure 11. Percent change in the county-level deer harvest in Missouri in 2018 compared to the 5-year average.

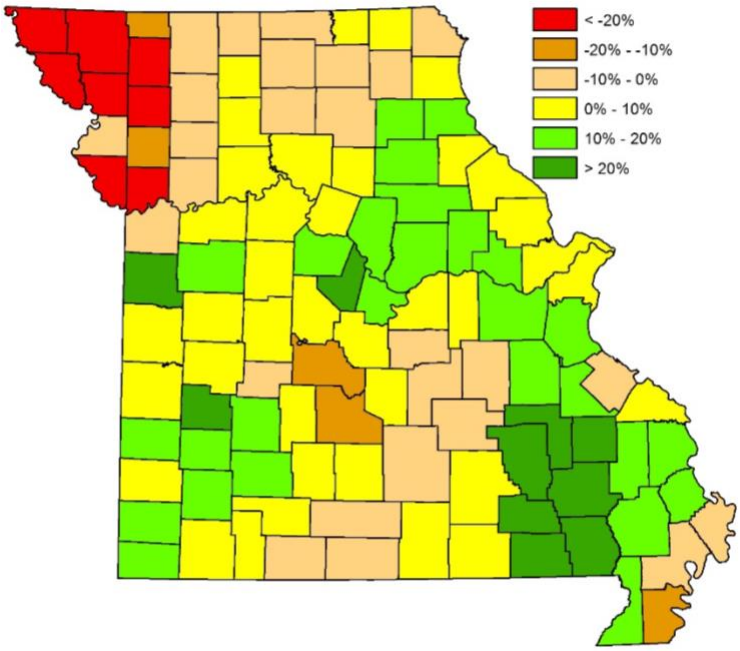


Figure 12. Percent change in the county-level deer harvest in Missouri in 2018 compared to the 10-year average.

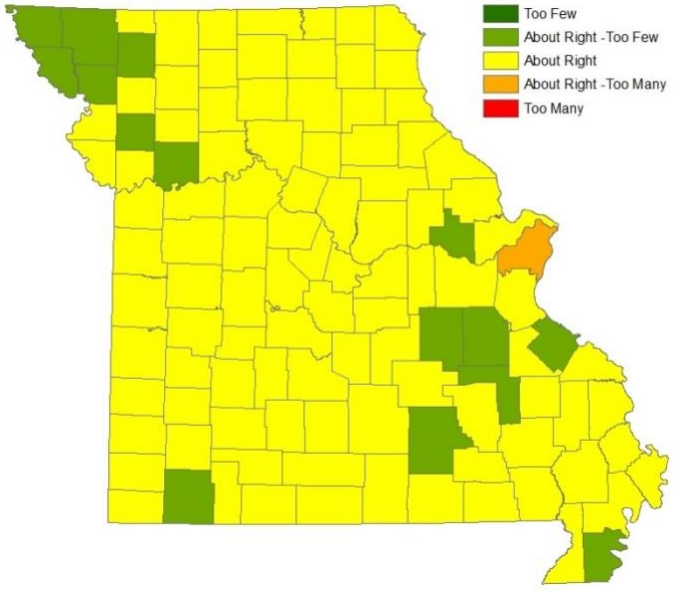


Figure 13. County-specific deer populations, in Missouri, based on socially acceptable levels, 2018. See page 16 for information on how this assessment was made.

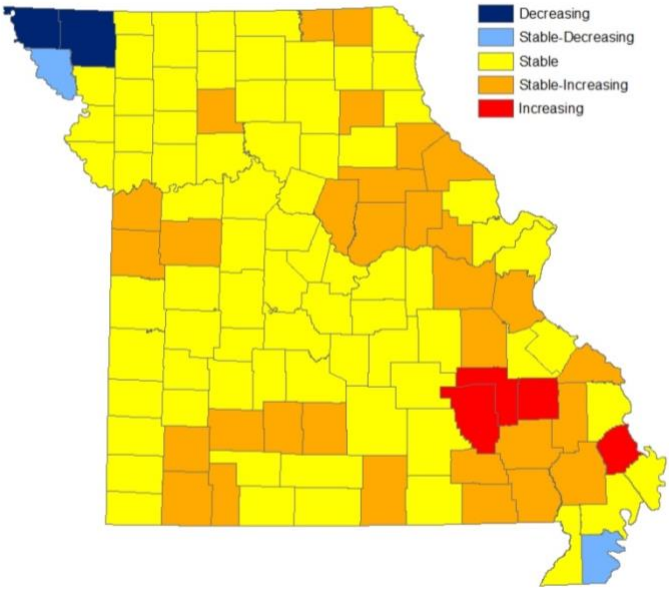


Figure 14. County-specific deer population trends in Missouri, 2018. See page 16 for information on how this assessment was made.

Table 5. County Deer Harvest Totals

	Archery				Firearms				Totals[1]			
County	Antlered Buck	Button Buck	Doe	Total	Antlered Buck	Button Buck	Doe	Total	Antlered Buck	Button Buck	Doe	Total
Adair	252	56	297	605	1,216	255	934	2,405	1,468	311	1,231	3,010
Andrew	73	15	55	143	453	101	329	883	526	116	384	1,026
Atchison	52	10	46	108	288	49	193	530	340	59	239	638
Audrain	130	42	196	368	820	236	811	1,867	950	278	1,007	2,235
Barry	189	44	207	440	1,010	174	749	1,933	1,199	218	956	2,373
Barton	146	31	178	355	778	167	662	1,607	924	198	843	1,965
Bates	142	33	160	335	881	154	658	1,693	1,023	187	818	2,028
Benton	298	61	370	729	1,836	412	1,564	3,812	2,142	474	1,939	4,555
Bollinger	215	87	434	736	1,618	404	1,468	3,490	1,833	491	1,902	4,226
Boone	302	57	394	753	1,493	233	1,165	2,891	1,795	290	1,559	3,644
Buchanan	61	11	55	127	340	57	261	658	401	68	316	785
Butler	208	62	352	622	988	169	672	1,829	1,197	231	1,027	2,455
Caldwell	67	18	103	188	667	123	467	1,257	734	141	570	1,445
Callaway	355	93	557	1,005	2,068	503	1,972	4,543	2,443	598	2,540	5,581
Camden	260	95	410	765	1,060	299	1,131	2,490	1,321	399	1,578	3,298
Cape Girardeau	168	54	288	510	1,125	219	1,086	2,430	1,293	273	1,374	2,940
Carrol	131	18	159	308	1,067	158	667	1,892	1,198	176	826	2,200
Carter	200	106	388	694	1,066	192	712	1,970	1,300	320	1,157	2,777
Cass	180	47	206	433	979	185	715	1,879	1,160	233	921	2,314
Cedar	191	28	207	426	1,025	191	768	1,984	1,233	221	986	2,440
Chariton	120	20	121	261	989	161	731	1,881	1,114	181	853	2,148
Christian	198	39	226	463	867	153	644	1,664	1,066	192	870	2,128
Clark	262	42	261	565	938	237	782	1,957	1,200	279	1,043	2,522
Clay	114	28	172	314	336	60	208	604	469	95	403	967
Clinton	55	9	51	115	361	63	254	678	421	73	306	800
Cole	123	34	170	327	798	173	633	1,604	924	208	807	1,939
Cooper	149	36	205	390	1,065	262	953	2,280	1,216	298	1,158	2,672
Crawford	214	62	253	529	1,369	308	1,129	2,806	1,583	371	1,382	3,336
Dade	121	31	127	279	725	143	528	1,396	846	174	655	1,675
Dallas	226	41	282	549	1,257	250	1,084	2,591	1,483	292	1,374	3,149
Daviess	133	33	188	354	1,003	204	783	1,990	1,136	237	972	2,345
DeKalb	55	21	66	142	396	75	325	796	451	96	391	938
Dent	166	58	180	404	1,275	295	1,118	2,688	1,441	354	1,309	3,104

[1]Includes deer harvested during managed hunts.

Table 5. County Deer Harvest Totals

	Archery				Firearms				Totals[1]			
County	Antlered Buck	Button Buck	Doe	Total	Antlered Buck	Button Buck	Doe	Total	Antlered Buck	Button Buck	Doe	Total
Douglas	159	45	181	385	1,182	234	852	2,268	1,341	279	1,033	2,653
Dunklin	43	7	58	108	220	31	127	378	263	38	185	486
Franklin	392	88	550	1,030	2,282	531	1,970	4,783	2,675	619	2,520	5,814
Gasconade	218	56	278	552	1,575	342	1,296	3,213	1,793	398	1,574	3,765
Gentry	74	16	113	203	593	99	416	1,108	667	115	529	1,311
Green	276	57	369	702	1,052	178	846	2,076	1,336	243	1,238	2,817
Grundy	130	19	144	293	736	128	525	1,389	866	147	669	1,682
Harrison	255	27	249	531	1,248	215	861	2,324	1,503	242	1,110	2,855
Henry	172	90	342	604	1,132	261	1,060	2,453	1,304	351	1,403	3,058
Hickory	170	43	204	417	1,003	210	771	1,984	1,173	257	984	2,414
Holt	65	15	92	172	381	51	257	689	448	66	350	864
Howard	155	33	199	387	990	167	912	2,069	1,148	213	1,143	2,504
Howell	308	67	363	738	1,930	524	2,148	4,602	2,239	591	2,511	5,341
Iron	104	43	136	283	846	150	524	1,520	950	193	660	1,803
Jackson	307	54	337	698	426	72	288	786	798	168	799	1,765
Jasper	258	49	253	560	1,084	157	652	1,893	1,342	206	905	2,453
Jefferson	486	128	610	1,224	1,645	324	1,371	3,340	2,132	452	1,981	4,565
Johnson	175	44	206	425	1,062	258	857	2,177	1,239	323	1,115	2,677
Knox	212	63	255	530	1,034	228	851	2,113	1,246	291	1,106	2,643
Laclede	240	51	284	575	1,417	296	1,054	2,767	1,657	347	1,346	3,350
Lafayette	64	29	102	195	524	159	461	1,144	588	188	563	1,339
Lawrence	134	40	168	342	855	148	621	1,624	989	188	789	1,966
Lewis	166	43	194	403	911	221	807	1,939	1,077	264	1,001	2,342
Lincoln	212	98	334	644	1,342	338	1,335	3,015	1,554	436	1,669	3,659
Linn	234	43	240	517	1,190	210	865	2,265	1,425	267	1,160	2,852
Livingston	126	30	130	286	947	158	644	1,749	1,074	188	774	2,036
Macon	315	69	382	766	1,833	339	1,348	3,520	2,149	412	1,749	4,310
Madison	135	69	221	425	995	281	846	2,122	1,130	350	1,067	2,547
Maries	136	45	180	361	820	212	825	1,857	956	257	1,006	2,219
Marion	158	28	204	390	899	216	773	1,888	1,057	244	978	2,279
McDonald	175	27	187	389	894	130	663	1,687	1,069	157	850	2,076

[1]Includes deer harvested during managed hunts.

Table 5. County Deer Harvest Totals

	Archery				Firearms				Totals[1]			
County	Antlered Buck	Button Buck	Doe	Total	Antlered Buck	Button Buck	Doe	Total	Antlered Buck	Button Buck	Doe	Total
Mercer	267	30	258	555	965	130	608	1,703	1,233	160	866	2,259
Miller	208	58	208	474	1,157	297	1,128	2,582	1,365	355	1336	3,056
Mississippi	19	2	25	46	161	9	66	236	180	11	91	282
Moniteau	83	21	128	232	735	180	704	1,619	818	201	832	1,851
Monroe	232	70	284	586	1,338	360	1,219	2,917	1,572	432	1515	3,519
Montgomery	165	54	253	472	1,224	325	1,219	2,768	1,389	379	1473	3,241
Morgan	270	72	359	701	1,495	409	1,488	3,392	1,765	481	1847	4,093
New Madrid	28	2	30	60	176	20	79	275	204	22	109	335
Newton	267	34	238	539	1,112	149	700	1,961	1,389	185	950	2,524
Nodaway	125	18	94	237	713	106	485	1,304	838	124	579	1,541
Oregon	227	66	310	603	1,526	477	1,823	3,826	1,753	543	2133	4,429
Osage	267	77	359	703	1,847	379	1,753	3,979	2,114	456	2112	4,682
Ozark	147	46	168	361	1,134	187	934	2,255	1,319	235	1116	2,670
Pemiscot	13	3	18	34	53	7	40	100	66	10	58	134
Perry	104	28	207	339	1,142	273	1,184	2,599	1,246	301	1391	2,938
Pettis	157	41	221	419	905	216	830	1,951	1,062	257	1051	2,370
Phelps	148	47	200	395	852	286	873	2,011	1,000	333	1073	2,406
Pike	263	101	465	829	1,558	347	1,636	3,541	1,827	449	2110	4,386
Platte	104	33	176	313	368	55	251	674	472	88	427	987
Polk	226	43	261	530	1,189	239	889	2,317	1,415	283	1150	2,848
Pulaski	193	64	266	523	735	213	763	1,711	928	277	1029	2,234
Putnam	311	35	350	696	1,118	149	740	2,007	1,429	184	1090	2,703
Ralls	171	35	224	430	1,014	239	816	2,069	1,185	274	1040	2,499
Randolph	174	39	205	418	1,147	209	953	2,309	1,321	248	1158	2,727
Ray	86	17	106	209	693	118	458	1,269	779	135	564	1,478
Reynolds	198	79	341	618	1,337	258	873	2,468	1,536	337	1214	3,087
Ripley	204	65	385	654	1,496	424	1,659	3,579	1,700	489	2044	4,233
St. Charles	204	51	254	509	698	159	587	1,444	980	248	962	2,190
St. Clair	276	70	303	649	1,468	299	1,175	2,942	1,747	369	1478	3,594
St. Francois	163	56	220	439	889	224	711	1,824	1,053	285	956	2,294
St. Louis	343	111	606	1,060	360	69	302	731	750	200	1004	1,954

[1]Includes deer harvested during managed hunts.

Table 5. County Deer Harvest Totals

	Archery				Firearms				Totals[1]			
County	Antlered Buck	Button Buck	Doe	Total	Antlered Buck	Button Buck	Doe	Total	Antlered Buck	Button Buck	Doe	Total
Ste. Genevieve	101	38	166	305	968	195	768	1,931	1,069	233	934	2,236
Saline	111	33	147	291	803	200	664	1,667	914	233	811	1,958
Schuyler	141	32	161	334	711	176	625	1,512	852	208	786	1,846
Scotland	269	54	280	603	1,124	261	978	2,363	1,393	315	1,258	2,966
Scott	52	12	81	145	319	52	249	620	371	64	330	765
Shannon	154	41	194	389	1,205	272	1,071	2,548	1,360	315	1,267	2,942
Shelby	228	48	297	573	1,199	273	941	2,413	1,427	321	1,238	2,986
Stoddard	178	84	303	565	780	141	592	1,513	976	229	919	2,124
Stone	147	32	187	366	695	98	495	1,288	842	130	682	1,654
Sullivan	225	26	243	494	1,247	156	877	2,280	1,472	182	1,120	2,774
Taney	194	40	223	457	878	158	672	1,708	1,072	198	895	2,165
Texas	261	60	284	605	1,894	436	1,560	3,890	2,155	496	1,844	4,495
Vernon	202	69	289	560	1,106	263	924	2,293	1,323	335	1,227	2,885
Warren	240	59	277	576	1,131	241	869	2,241	1,371	300	1,146	2,817
Washington	173	69	224	466	1,124	308	901	2,333	1,297	378	1,125	2,800
Wayne	277	132	555	964	1,997	488	1,441	3,926	2,289	623	2,009	4,921
Webster	208	57	233	498	1,161	212	887	2,260	1,369	269	1,120	2,758
Worth	105	17	91	213	407	51	277	735	512	68	368	948
Wright	189	42	178	409	1,145	202	781	2,128	1,334	244	959	2,537
Central	2,932	806	4,043	7,781	17,950	4,217	16,654	38,821	20,911	5,044	20,783	46,738
Kansas City	2,191	599	2,884	5,674	11,023	2,394	8,991	22,408	13,327	3,068	12,144	28,539
Northeast	3,379	741	4,102	8,222	17,287	3,666	14,280	35,233	20,675	4,414	18,423	43,512
Northwest	2,214	387	2,361	4,962	13,437	2,257	9,406	25,100	15,666	2,659	11,826	30,151
Ozark	2,356	707	3,097	6,160	15,440	3,742	14,294	33,476	17,870	4,476	17,475	39,821
Southeast	2,006	758	3,435	6,199	13,614	2,921	10,726	27,261	15,656	3,691	14,226	33,573
Southwest	3,366	687	3,834	7,887	17,002	3,053	12,685	32,740	20,404	3,758	16,593	40,755
St. Louis	2,264	666	3,108	6,038	9,951	2,278	8,464	20,693	12,342	3,004	11,789	27,135
Statewide	20,708	5,351	26,864	52,923	115,704	24,528	95,500	235,732	136,851	30,114	123,259	290,224

[1]Includes deer harvested during managed hunts.

Deer Management Goals on Conservation Areas

There are hundreds of conservation areas managed by MDC across Missouri. Each of these areas serves multiple purposes. One of the uses on many areas is hunting, with deer hunting being a popular activity on conservation areas around the state. Deer hunting regulations vary across conservation areas, with some areas being archery only, others allowing archery and muzzleloading methods, and yet others allowing statewide methods. Use of antlerless permits can also vary by area (**Table 6**). Given the popularity of deer hunting and the complexity of trying to balance multiple uses, the Missouri Department of Conservation recently moved to qualify conservation areas into three categories (Level 1, Level 2, and Level 3) based on how those areas are managed in relation to deer management and hunting opportunities.

Level 1: Conservation areas are those less than 1,000 acres. On these areas it is difficult to have meaningful impacts on a local deer population due to the relatively small size of the area, but it is possible to still allow a safe and enjoyable deer hunting experience.

Level 2: Conservation areas are at least 1,000 acres in size. These areas are large enough that their management can have a significant impact on local deer populations. Level 2 areas are managed to provide quality deer hunting opportunities, maintain a deer density at or above the county-level, and meet the year-round habitat needs of deer when compatible with other area priorities. Level 2 areas aim to provide a quality opportunity with a reasonable likelihood of seeing and harvesting a deer.

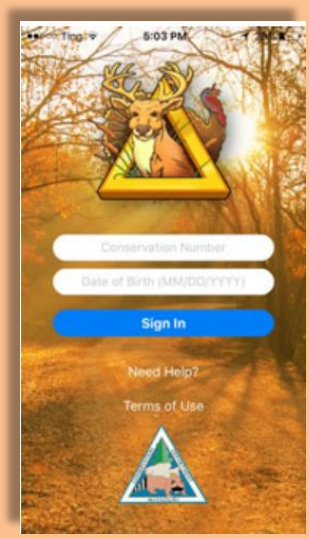
Level 3: Conservation areas are larger areas of at least 3,000 acres in size. These areas are large enough that deer management efforts can target specific population goals. There are 10 level 3 conservation areas spread across Missouri counties. They include: Bunch Hollow (Carroll), Bushwhacker Lake (Barton, Vernon), Davisdale (Howard), Deer Ridge (Lewis), Otter Slough (Stoddard), Peck Ranch (Carter, Shannon), James A. Reed (Jackson), Reform (Callaway), Emmett and Leah Seat Memorial (Gentry, Worth), and Whetstone Creek (Callaway). Level 3 areas are typically managed to provide for the year-round habitat needs of deer and managed for deer densities at or above county levels. Deer hunting regulations on these areas are often more restrictive than Level 1 and 2 areas with a goal of providing hunters with a high success rate and/or the opportunity to harvest a mature buck. Given the goals of managing for a deer population at or greater than the county level density and trying to increase the age-structure of the male segment of the population. There are no Level 3 areas within the Chronic Wasting Disease Management Zone. Area managers often use combinations of managed deer hunts with various methods of take, antler-point restrictions, and antlerless permits to meet management goals. Area managers use various survey methods to track deer population trends on the areas. Additionally, many managers of Level 3 areas will survey hunters to measure hunter satisfaction and to obtain input about future regulations on the area. Area managers work to keep regulations as consistent as possible over time. When regulation changes are proposed, they use a combination of population surveys, harvest numbers, hunter satisfaction reports, and habitat assessments to inform new recommendations to help them achieve area-specific goals.

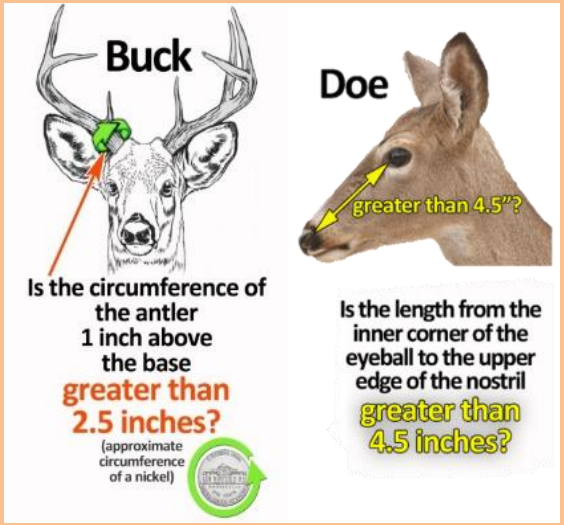
Table 6. Regional Breakdown of Conservation Areas Allowing Deer Hunting

Region	Conservation Areas that allow deer hunting	Conservation Areas by allowed deer hunting methods			Conservation Areas that allow use of antlerless permits
		Archery and Firearms	Muzzleloader and Archery	Archery Only	
Northwest	77	41	22	14	45
Northeast	62	39	10	13	52
Kansas City	87	36	28	23	59
Central	66	28	16	22	43
St. Louis	40	17	5	18	30
Southwest	83	37	19	27	69
Ozark	67	43	0	24	64
Southeast	71	33	12	26	28
Total	553	274	112	167	390

Telecheck

Missouri's big-game harvest reporting system, Telecheck, is a powerful monitoring and management tool used by Deer and Elk Program staff. Telecheck provides an annual record of harvested deer which helps biologists understand deer population trends and hunter success through time. Telecheck also provides information on the composition—number of male and female fawns, yearlings, and adults—of the annual harvest. Harvest composition is important for understanding the impact of hunters on county deer populations, which helps inform management decisions such as bag limits and season lengths.





Hunters are asked to take a measurement from their harvested deer and answer a question in Telecheck. The purpose of these measurements is to determine the age of the deer that was harvested. The question about does helps differentiate between female fawns (0.5-year-old) and older females, and the question about bucks helps differentiate between yearling (1.5 years old) males and older bucks.

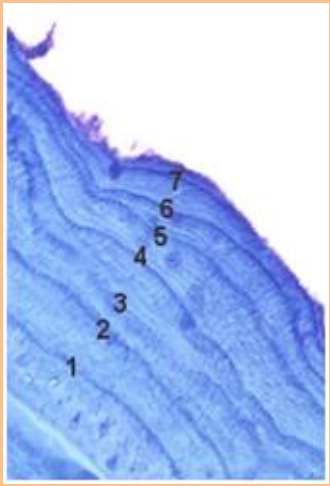
Age-at-Harvest Sampling

In addition to the information collected through Telecheck, the MDC Deer and Elk Program works with universities and meat processors across the state to collect teeth from harvested deer. Extracted teeth are sent to a lab to age the harvested animals. Much like growth rings on a tree, deer deposit a ring of material called "cementum" on the roots of their teeth each year. These rings can be counted to accurately determine the age of adult deer.

Incisor tooth of a deer

Table 7. Oldest aged male and female deer, as determined from cementum annuli samples, in Missouri, 2018.

Region	Oldest Aged Male Deer	Oldest Aged Female Deer
Central	8	16
Kansas City	6	15
Northeast	8	13
Northwest	6	15
Ozark	9	18
Southeast	6	15
Southwest	10	16
St. Louis	12	18



Layers of cementum deposited on the root of a deer tooth

Archery Deer Season Summary

The 2018 archery deer season marked the third year of crossbows being a legal method for all archery hunters in Missouri. The Conservation Department began allowing crossbows during the archery season to increase hunter participation. Over the long-term, MDC hopes that allowing crossbows will recruit more youth and adult hunters into archery hunting, retain aging adult hunters that may not be able to draw back vertical bows, and reactivate hunters that have previously participated in the archery season.

During the 2018 archery deer season, hunters harvested 52,923 deer, which was 2% higher than in 2017 and 7% higher than the previous five-year average. The 2018 archery deer harvest was the highest archery harvest total to date. The percentage of the 2018 archery harvest that was taken by hunters using a crossbow was 43%, which was up from 38% in 2017, and from 30% in 2016.

Despite over 40% of the archery harvest being comprised of deer harvested with crossbows, the overall archery harvest trend has remained relatively unchanged (slightly increasing) over the past decade (**Figure 15**). The average deer harvest during the first three years after crossbows became a legal method is about 2% greater than the average from the three previous years.

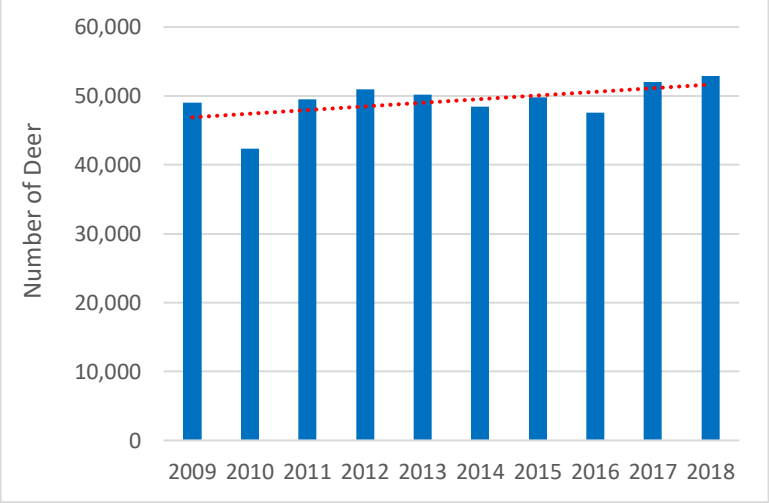


Figure 15. Number of deer harvested during Missouri's archery season, 2009–2018.

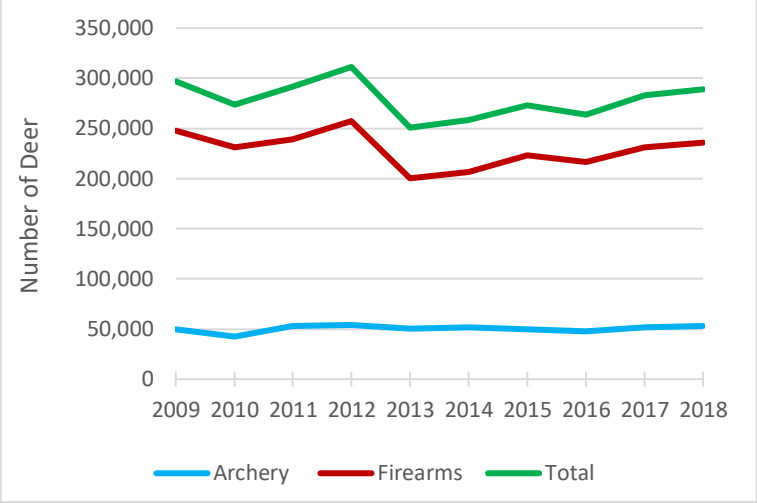


Figure 16. Number of deer harvested during the archery, firearms, and combined archery and firearms hunting seasons in Missouri, 2009–2018.

Missouri's overall deer harvest continues to be largely driven by harvest during the firearms portions, which typically accounts for over 80% of the total harvest (**Figure 16**). Overall, deer harvest in Missouri has exhibited an increasing trend during the last five years as the deer population in many areas of the state has rebounded from the severe hemorrhagic disease outbreak that occurred in 2012.

Of the deer harvested during the 2018 archery season, 20,708 were antlered bucks, 5,351 were button bucks, and 26,864 were does. It does not appear that the allowance of crossbows has affected the composition of the archery harvest (**Figure 17**). During the three years prior to allowing crossbows (2013–2015), the average percentage of antlered bucks, button bucks, and does was 40%, 11%, and 49%, respectively. From 2016–2018, these averages were 41%, 10%, and 49%, respectively.

The archery season continues to be a very popular hunting season in Missouri **(Figure 18)**. In 2018, 123,883 Archery Any-Deer Hunting Permits were purchased, which was 1% greater than in 2017, 4% above the previous five-year average, and the highest number since the archery season was initiated. Consequently, there has been a declining trend in the number of firearms deer permits purchased the last several years as more and more hunters continue to participate in the archery season. Results of MDC's 2017 Archery Deer Hunter Survey indicate that the age-distribution of respondents differed

considerably based on whether they hunted exclusively with a compound bow or a crossbow (**Figure 19**). On average, a greater percentage of crossbow users were older hunters. The median age of a respondent that used a compound bow exclusively was 44 years old, whereas the median age of a respondent that hunted exclusively with a crossbow was 57 years old. Moreover, hunters ages 61-85 represented just 13% of respondents that hunted exclusively with a compound bow, however, this age group represented 40% of respondents that hunted exclusively with a crossbow.

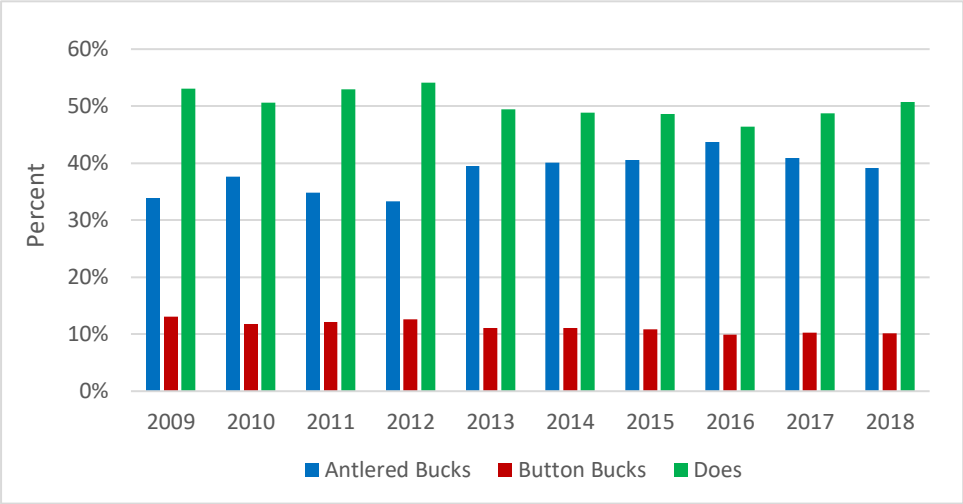


Figure 17. Percentage of antlered bucks, button bucks, and does in the archery season harvest in Missouri, 2009–2018.

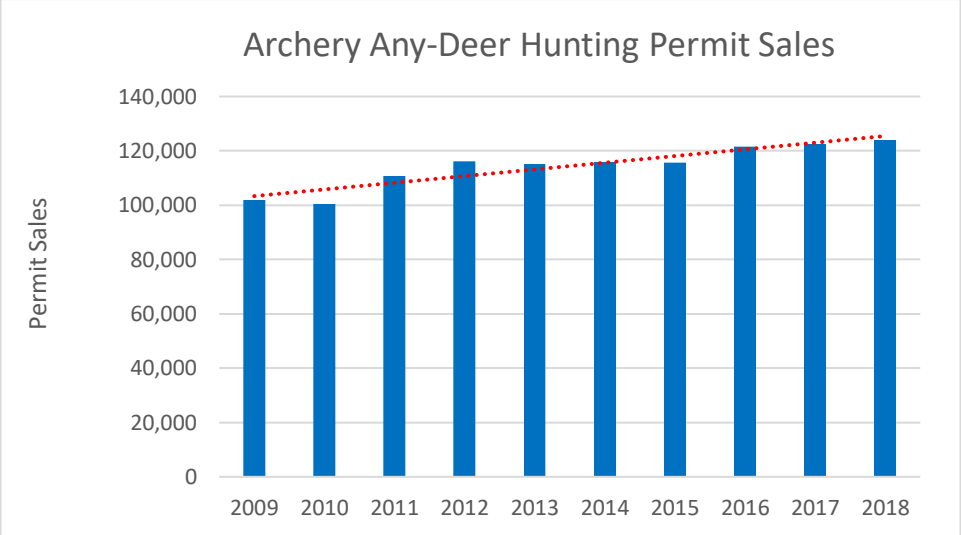


Figure 18. Number of Archery Any-Deer hunting permits sold in Missouri, 2009–2018. Permit sales do not include no-cost landowner permits or archery antlerless deer hunting permits.

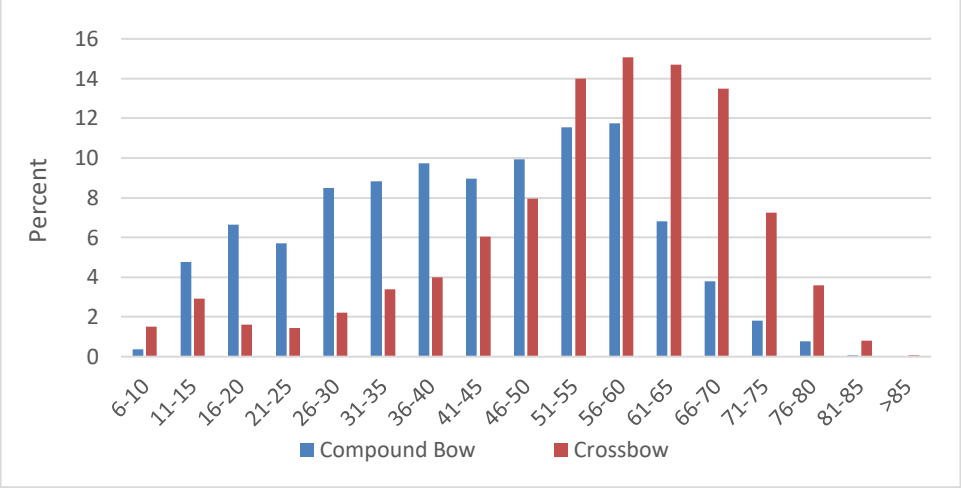


Figure 19. Age distribution of respondents to the Missouri Department of Conservation's 2017 Archery Deer Hunter Survey based on whether respondents hunted exclusively with a compound bow or crossbow.

Deer Management on Private Land—Developing a Successful Deer Management Plan

Recall the last time you took a trip to a location to which you had never been before. If traveling by car, you likely used a roadmap or GPS to help you navigate to ensure you reached the intended destination in the most efficient manner possible. Similarly, for those with specific deer management objectives, the "roadmap" to success is a written management plan. The following are some considerations when developing a deer management plan for your property:

1. Set Realistic Deer Management Goals

A deer management plan begins by identifying the end goal, or destination, for the deer population being managed. Some common management goals include increasing or decreasing herd density, increasing the average age or antler size of bucks, and balancing the adult sex ratio. Regardless of what goals are selected, it is important that they be realistic and achievable, as setting unrealistic goals will quickly lead to disappointment. When setting goals, consider property characteristics such as size and shape, deer management practices on adjacent lands, and habitat or land use on surrounding properties. Large properties (500 acres or more) will provide the most control and greatest ability to impact local deer populations. Smaller properties are more subject to land use and management decisions on neighboring properties because most deer will frequently use multiple properties. Landowners of small properties can overcome these challenges by working cooperatively on common management goals with their neighbors, effectively increasing the size of land being managed. A landowner should also consider regional attributes such as soil quality, the productivity of dominant habitat types, and genetics which will impact whether a certain goal can be accomplished.

Consider setting goals with elements that can be achieved in phases. Seeing the progression toward achieving the final management goal will be a good indicator that management actions are having the intended effect and will keep those involved encouraged.

Lastly, consider setting goals using the S.M.A.R.T. acronym (specific, measurable, achievable, realistic, time-bound). The following is an example of a management objective written using the S.M.A.R.T. acronym: "By 2020, have a doe-to-buck ratio of 4 to 1 based on annual observation data. By 2022, have a doe-to-buck ratio of 3 to 1." This objective is specific, measurable, and time-bound. It also has stages which can be used to track progress and encourage continued management. Whether the objective is realistic and achievable depends on considerations previously described and should be given careful consideration.

2. Determine Which Management Practices to Implement

After the goals for the property have been identified, consider the available management practices that will yield the desired results. Possible deer management practices include increasing or decreasing doe harvest, applying harvest criteria to bucks, or implementing habitat management practices designed to impact cover and/or food availability and quality. The management practice and the intensity at which a practice is used, will depend on the management goals.

3. Monitor management progress

Achieving deer management goals will not happen overnight, and typically will take multiple years. An important part of a successful deer management plan is monitoring your progress to ensure that management actions are having the intended effect. If so, you know you are on the right track. If not, adjustments to management tactics or to the management goals may be needed. Therefore, collecting data by monitoring the deer herd and habitat quality throughout the year is important.

Information on various monitoring methods can be found at https://extension2.missouri.edu/ and search "deer," or contact the MDC Private Lands Deer Biologist at (573) 815-7901 ext. 2899.

Deer Research Projects

Southeast Deer Cropland Study

A 3-year study began during 2016 in southeast Missouri to better understand deer movement ecology related to small soybean fields. To help us understand deer movement, MDC captured and fitted deer with GPS collars during the summer months from 2016-2018. A total of 76 adult does were collared. The GPS collars will help us understand how deer utilize the landscape and help to inform landowners and hunters about deer movements and target efforts to reduce deer densities, especially where deer are causing crop damage. Preliminary data show deer stay relatively close to their capture locations throughout the year. This indicates that deer causing damage during the growing season are typically available for harvest on the same property in the fall.

Crop damage assessments, crop damage manipulation, and crop planting timing are being investigated in addition to the collaring efforts. We know that the timing of the plant damage can impact yields in different ways, even leading to increases in yield in some cases. There may also be a correlation in the amount of damage and its impact on yield based on when the crop was planted during the growing season. Our goal is to provide that information to farmers as another way to understand and possibly minimize the impacts of deer damage on crop yield. **For more information, contact the Deer and Elk Biologist at (573) 815-7901 ext. 2892.**

Survival, Recruitment, and Movement of White-tailed Deer in Missouri

This study is designed to estimate deer reproduction, movement, and survival in 2 contrasting Missouri landscapes: the glaciated plains of the north and the forested hills of the central Ozarks. Movement data from the first 4 years of the study were examined for dispersal events, or long-distance movements outside of a normal home range that lead to the establishment of a new home range. This behavior is common among young deer (especially males), typically within their first 18 months of life, but also occurs among older individuals at a lower rate.

A total of 442 dispersal events were identified that averaged 5.02 miles (5.48 miles for males, 4.25 miles for females) in northern Missouri and 3.72 miles (4.24 miles for males, 2.93 miles for females) in the Ozarks. Additionally, 91.3% of dispersals in north Missouri were less than 10 miles and 96.0% of dispersals were less than 10 miles in the Ozarks (**Figure 20**). These results have important implications for how MDC manages chronic wasting disease (CWD). To help control disease spread and prevalence, MDC establishes a CWD Management Zone (MZ) in areas close to where CWD has been detected. Previously, a 25-mile radius was used to designate counties included in the CWD MZ because deer in Missouri were believed to commonly disperse up to 25 miles. Data from the current study, however, indicates that 25-mile dispersals are quite rare in Missouri. Therefore, in 2019 the CWD MZ was resized to include only counties within 10 miles of known CWD-positive locations to more accurately reflect where the risk of CWD spread is the greatest. **For questions about this study, contact the Private Lands Deer Biologist at (573) 815-7901 ext. 2899.**

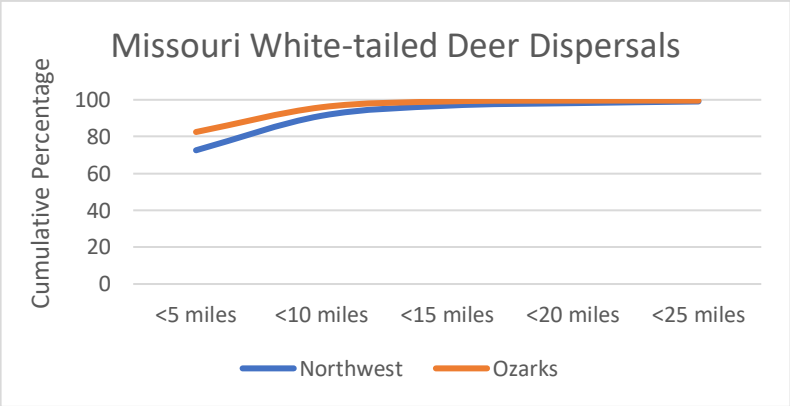
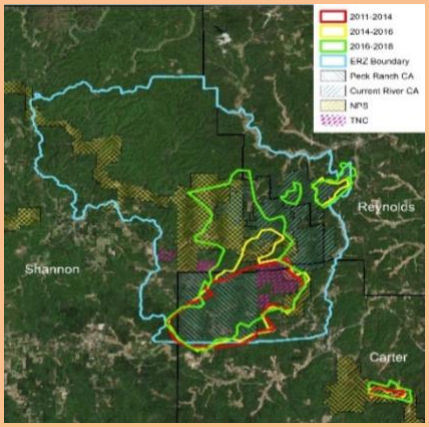


Figure 20. Dispersals of white-tailed deer in Northwest Missouri and the central Ozarks, 2015-2018. Greater than 90% of dispersals are less than 10 miles within both study areas.

Restoring Elk in Missouri

	2011-2014	2015-Present	Eastern Elk Populations
Adult cow survival	0.91	0.96	0.92
Adult bull survival	0.94	0.75	0.93
Yearling cow survival	0.82	0.89	0.91
Yearling bull survival	0.91	0.78	0.85
Calf survival	0.45	0.67	0.75
Adult reproduction	0.63	0.82	0.75

Survival and reproductive rates for elk in Missouri during and immediately after reintroduction (2011-2014) and post-reintroduction (2015-present) compared to other eastern elk populations.



Elk range in Missouri has expanded through time.

Elk, a native species in Missouri, disappeared from the state during the mid-1800s primarily due to unregulated hunting. Elk were reintroduced into Missouri in parts of Carter, Reynolds, and Shannon counties between 2011 and 2013. This area was chosen for elk restoration due to the high amount of public land, low road density, and low row-crop acreage. The target population is around 400-500 individuals and plans are to manage the herd through regulated hunting in the coming years as the population grows.

Researchers with MDC, the University of Missouri, and the University of Montana have been busy monitoring the elk. Crews captured additional elk in Missouri from 2015-2018 to assess their health and to equip them with collars. Capture of these individuals is part of regular monitoring efforts to help better understand how elk are using the landscape, to determine pregnancy status among cow elk, and to monitor survival. The information collected from these collars has helped researchers develop a model to track population growth and make sound management decisions. The population is currently estimated to be around 175 individuals.

As a result of the increasing number of elk, an annual growth rate exceeding 10%, and a high bull: cow ratio, the Department recently proposed an initial framework for elk hunting in Missouri. In December 2018, MDC sought input from the public on various factors pertaining to elk hunting in Missouri. Using that input and other biological considerations, a hunting framework was created. Assuming the previously mentioned metrics continue their current trend, the first elk hunt in Missouri could be as early as 2020.

Permits would be distributed by a random lottery, and hunting would be permitted in Carter, Reynolds, and Shannon Counties. Missouri residents at least 11 years old and hunter-education certified (or exempt) would be eligible to apply. There would be a general hunting permit and a landowner permit. There would be a $10 application fee for the general permit, but there would be no application fee for the landowner permit. If drawn, the permit would cost $50 and there would be a 10-year sit-out period for those drawing a general permit. Permits would be valid during 2 hunting seasons: a 9-day archery season in mid-October and a 9-day firearms season in early December.

For more information, visit mdc.mo.gov or contact the Deer and Elk Biologist at (573) 815-7901 ext. 2892.

Chronic Wasting Disease

Chronic wasting disease (CWD) is a contagious, always fatal disease of deer, elk, and other members of the deer family. It spreads by direct animal to animal contact, through animal contact with saliva, feces, and carcass parts of infected animals, and by animal contact with contaminated soil, water, or plant material. There is no known cure, treatment, or vaccine for CWD. Over time, CWD can spread widely and infect a large percentage of a population. When CWD becomes widely established, survival rates decrease, and population impacts are expected. The best way to manage CWD is to prevent its introduction into new areas and limit its spread.

What Does CWD Look Like?

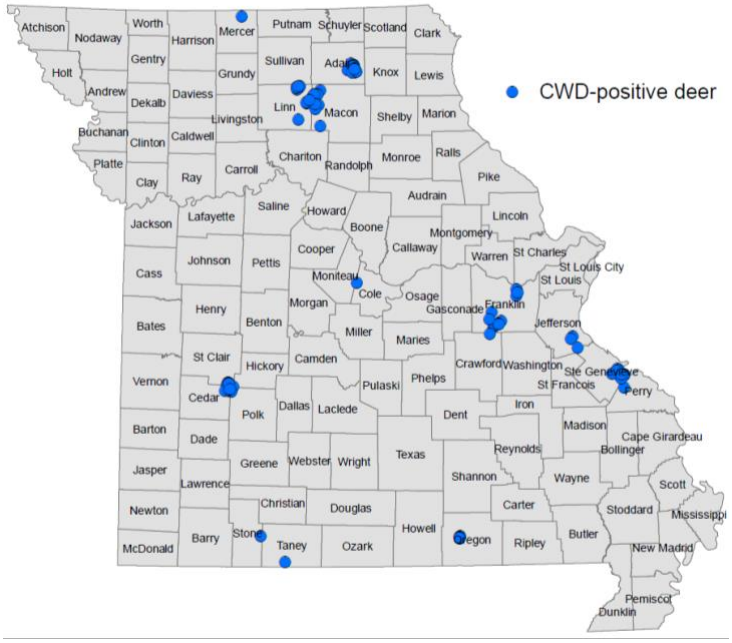
CWD is a slowly progressing disease. From the time of exposure, it takes an average of 18 months for a deer to appear sick. Once signs of CWD develop, a deer's condition declines rapidly. Animals exhibiting clinical signs of CWD are rarely seen, except in areas where the number of infected deer is very high. Animals in the late stages of CWD are often emaciated, show erratic behavior, and exhibit neurological irregularities. However, due to the long, slow advancement of the disease, infected animals are often killed by predators, vehicles, hunters, or other diseases before signs of CWD get bad enough to be recognizable.

CWD suspect deer
Photo courtesy of Michael Way

CWD in Missouri

Routine, statewide CWD surveillance began in Missouri in 2002. The disease was first detected in captive deer in Linn County in 2010, in captive deer in Macon County in 2011, and in free-ranging deer in Macon County in 2012. Considering the ten-year surveillance history prior to detection of CWD in free-ranging deer and the limited number of cases found in 2012, we know CWD is a relatively new disease in Missouri. As of June 2019, CWD has been detected in a total of 116 free-ranging deer in 16 counties. While the introduction of CWD into new areas of Missouri is concerning, the percent of CWD-positive deer in these areas remains low, and CWD remains relatively rare in the state.

CWD-positive free-ranging detections through June 2019.



County	Year of 1st Detection	Total CWD+ To Date
Adair	2014	16
Cedar	2017	1
Cole	2014	1
Crawford	2018	1
Franklin	2015	13
Jefferson	2016	3
Linn	2015	11
Macon	2012	34
Mercer	2018	1
Oregon	2018	5
Perry	2017	1
Polk	2017	6
St Clair	2016	8
Ste Genevieve	2017	13
Stone	2018	1
Taney	2018	1
TOTAL		**116**

What is MDC Doing about CWD?

MDC is monitoring CWD where it is found, detecting the disease early in new locations, and working with hunters, taxidermists, meat processors, landowners, and others to slow or limit the further spread of CWD in Missouri. CWD-related regulations and management actions aim to keep the number of infected deer low over time and limit the potential impacts of the disease far into the future.

Surveillance and Monitoring

MDC works closely with hunters, taxidermists, meat processors, and others to sample and test deer for CWD. Most samples are taken from hunter-harvested deer. Sampling is conducted statewide, but a greater number of samples are collected in areas where CWD has been detected. Greater sampling intensity is needed in these areas to monitor the disease and find new areas of spread as soon as possible. Highlights of the 2018-2019 sampling efforts include:

- Partnerships with nearly 140 taxidermists and meat processors throughout the state who collected 7,220 samples
- Over 20,000 samples collected by MDC staff in 31 of 48 CWD Management Zone Counties on November 10-11 during mandatory CWD sampling
- Testing of 320 sick deer reported by landowners, hunters and the public

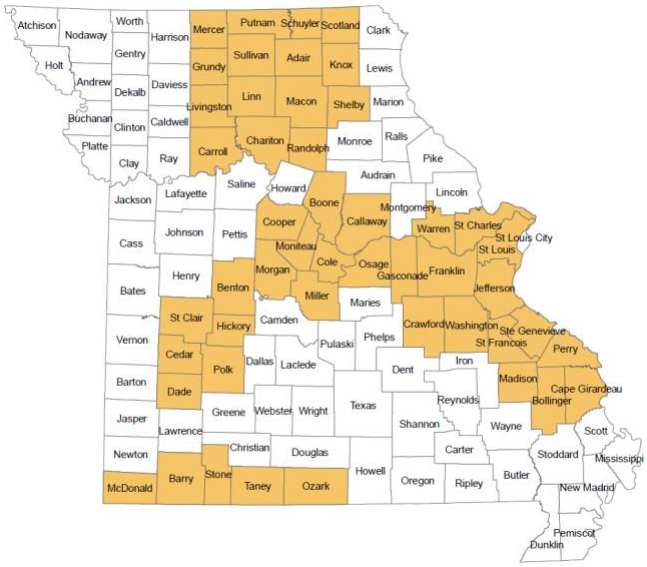
Disease Management Regulations

Beginning in 2012, regulation changes were implemented within the CWD Management Zone. From 2012-2018, the CWD Management Zone included all counties within 25-miles of CWD detections. The intent was to include areas that were high risk for CWD spread. Regulation changes included:

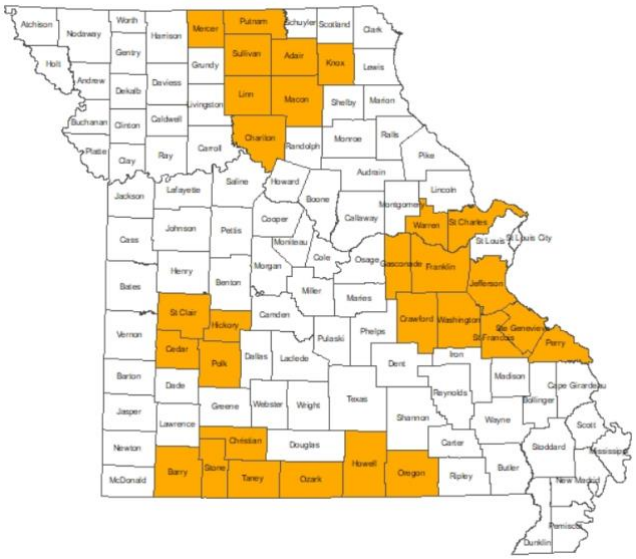
- A prohibition on the use of feed and minerals intended for deer. Use of these products can spread disease by concentrating animals and increasing contact between them.
- Removal of the antler-point restriction. This restriction protects the majority of yearling males, the deer that disperse the greatest distances and therefore are most likely to move CWD into new areas.
- Moderate increases in antlerless permit availability. These changes are designed to maintain stable populations in the CWD Management Zone and avoid population increases.

Beginning in July 2019, the number of counties included in the CWD Management Zone was decreased to exclude counties greater than 10-miles from CWD detections. The change was made after analysis of 4 years of data from a cooperative deer study conducted in Missouri. This study found that over 90% of deer in Missouri disperse less than 10 miles (see page 27 for more information about the research project). Additionally, Cole, Moniteau, and surrounding counties were removed from the CWD Management Zone because no additional cases of CWD have been found in central Missouri since a single detection in Cole County in March of 2015.

2018 CWD Management Zone Counties

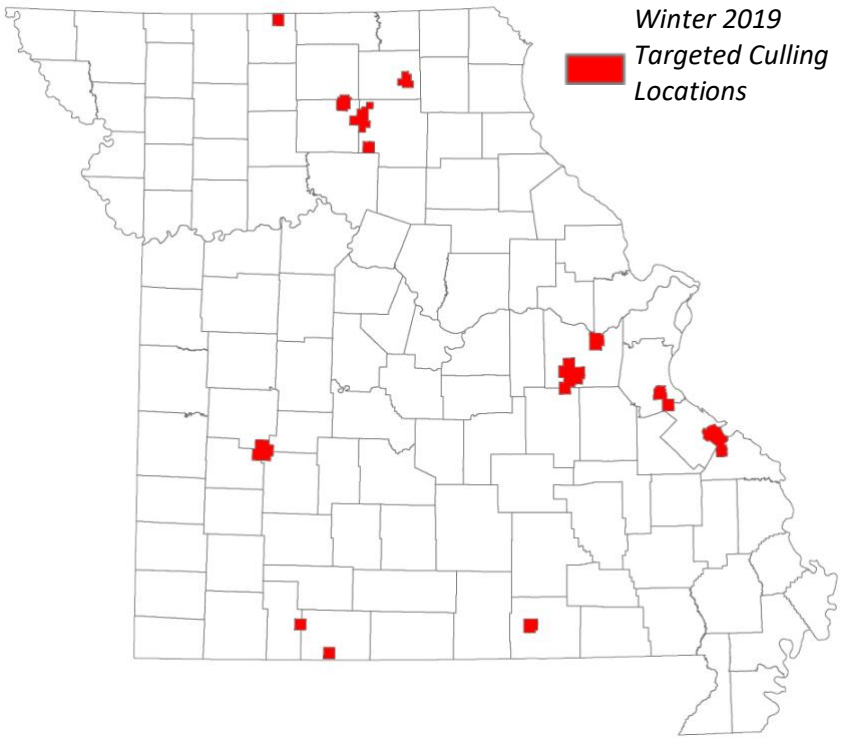


2019 CWD Management Zone Counties



Post-Season Targeted Culling

In localized areas where CWD is detected (within 1-2 square-miles), MDC works with landowners on a voluntary basis to remove additional deer after hunting seasons close. The intent is to remove a greater number of potentially infected deer from the population than what is removed through hunting alone. Evidence shows that decreasing the number of infected deer can slow CWD growth rates (how fast the proportion of infected deer in a population is increasing) and can limit the amount of CWD contamination in the surrounding environment. Decreasing deer densities in these areas may also decrease the number of contacts infected deer make with other deer.



Between January 16 and March 15, 2019, MDC staff and landowners collectively removed 2,244 deer from 13 different areas. Thirteen of these deer tested positive for CWD. Meat from deer in which CWD was not detected was returned to landowners or donated through the Share the Harvest program.

What can you do to Stop CWD?

Hunters, landowners, and wildlife watchers play a vital role in curbing the spread of CWD.
You can help in the following ways:

- Properly handle deer carcasses, especially when hunting in areas known to have CWD.
    - Leave highest risk parts (brain and spinal column) behind by quartering your deer or boning out meat at the site of harvest.
    - Dispose of all carcass parts moved from the harvest location in a permitted landfill. CWD remains infectious in the environment long after a carcass decays.
- Have deer harvested from the CWD Management Zone tested for CWD.
- Report sick deer to your local Conservation Agent or MDC office.
- Do not feed deer or place minerals intended for deer. If you are in a CWD Management Zone, these activities are prohibited.
- If you feed birds, do so in a way that excludes deer.

CWD and Human Health

There have been no known cases of CWD infection in humans, but some studies suggest CWD could be a risk. The Centers for Disease Control and Prevention (CDC) recommends that hunters have their deer tested before consuming it if hunting in an area where CWD has been found. The CDC also recommends not consuming meat from known CWD-positive animals. For more information, visit https://www.cdc.gov/prions/cwd/index.html.

For more information regarding CWD, visit mdc.mo.gov/cwd or contact the Wildlife Disease Coordinator at 573-815-7901 ext. 2934.

DEER CARCASSES CAN SPREAD CWD

CARCASS HANDLING TIPS FOR DEER HUNTERS

1) **Dispose of parts in a permitted landfill.** CWD is unlikely to migrate out of a permitted landfill and infect other deer. Take your carcass parts directly to a permitted landfill or use your regular trash collection service.
2) **Bury on site.** CWD in soil can remain infectious for years, but placing a barrier between the carcass and scavengers lowers the risks of spread.
3) **Leave in place**. If CWD is already on the property, it is better to leave it there than introduce it to a new area.
4) **Taxidermy and meat processing:** If using a taxidermist or meat processor, choose a business that utilizes a permitted landfill for disposal.

1) **Do not dispose of in water:** Do not dispose carcasses in ponds, lakes, or waterways.
2) **Do not burn:** Burning at normal temperatures does not destroy CWD.
3) **Do not transport to another property:** If you move carcass parts from the property where harvested, dispose of them in a permitted landfill. Bury only as a last resort; you will reduce but not eliminate the risk of spread.

LOWER RISK CARCASS PARTS:

- Meat that is cut and wrapped
- Meat that has been boned out
- Quarters with no part of the spinal column or head attached
- Tanned hides and finished taxidermy mounts
- Cleaned skulls, skull caps, and antlers with no tissue
- Capes
- Cleaned teeth

YOUR HEALTH: There have been no known cases of CWD in humans to date. The Centers for Disease Control and Prevention (CDC) recommends that hunters in areas with CWD take the following precautions:

- Strongly consider having your deer tested for CWD before you eat the meat.
- If your animal tests positive for CWD, do not eat meat from that animal.
- When field-dressing a deer:
  - Wear latex or rubber gloves when dressing the animal or handling the meat
  - Minimize handling the organs of the animal, particularly the brain or spinal cord tissues
  - Do not use household knives or other kitchen utensils for field dressing
- Don't consume animals that look sick.
- If you have your deer or elk commercially processed, consider asking that your animal be processed individually to avoid mixing meat from multiple animals.

FOR MORE INFORMATION ON CWD, PLEASE VISIT MDC.MO.GOV/CWD

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